FEBRUARY 13, 1961

PAPER TRADE JOURNAL

New Method Removes Past Problems Of Evaluating Pigments in Paper

What's New and Significant at Fibreboard's San Joaquin Mill?

"Syntosil" a Nylon-Content Paper Displays Remarkable Properties

Possible Causes Of, What To Do For Those Chain Drive Disorders

Contents of the Week, pages 4-5

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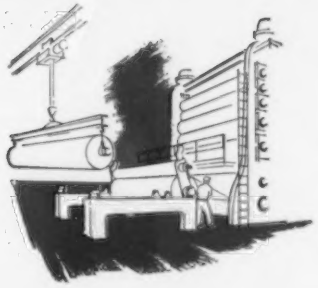
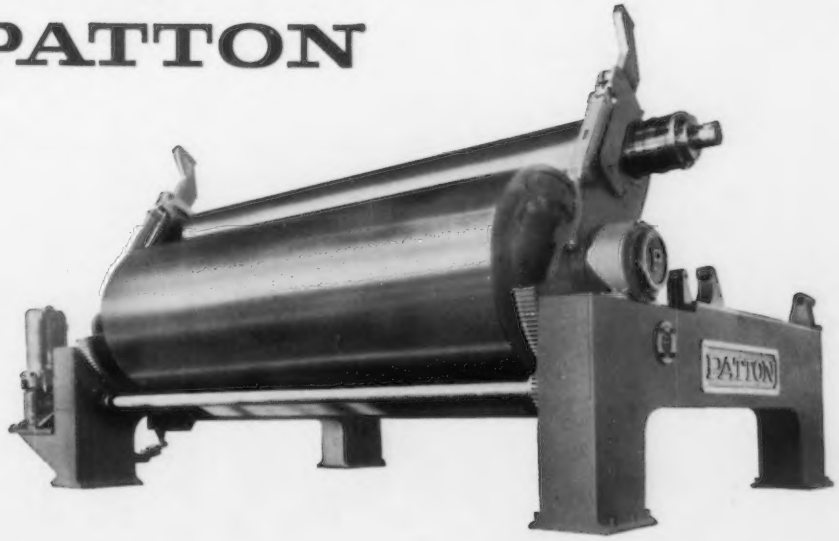


HORIZONTAL TRACK REELS

by PATTON



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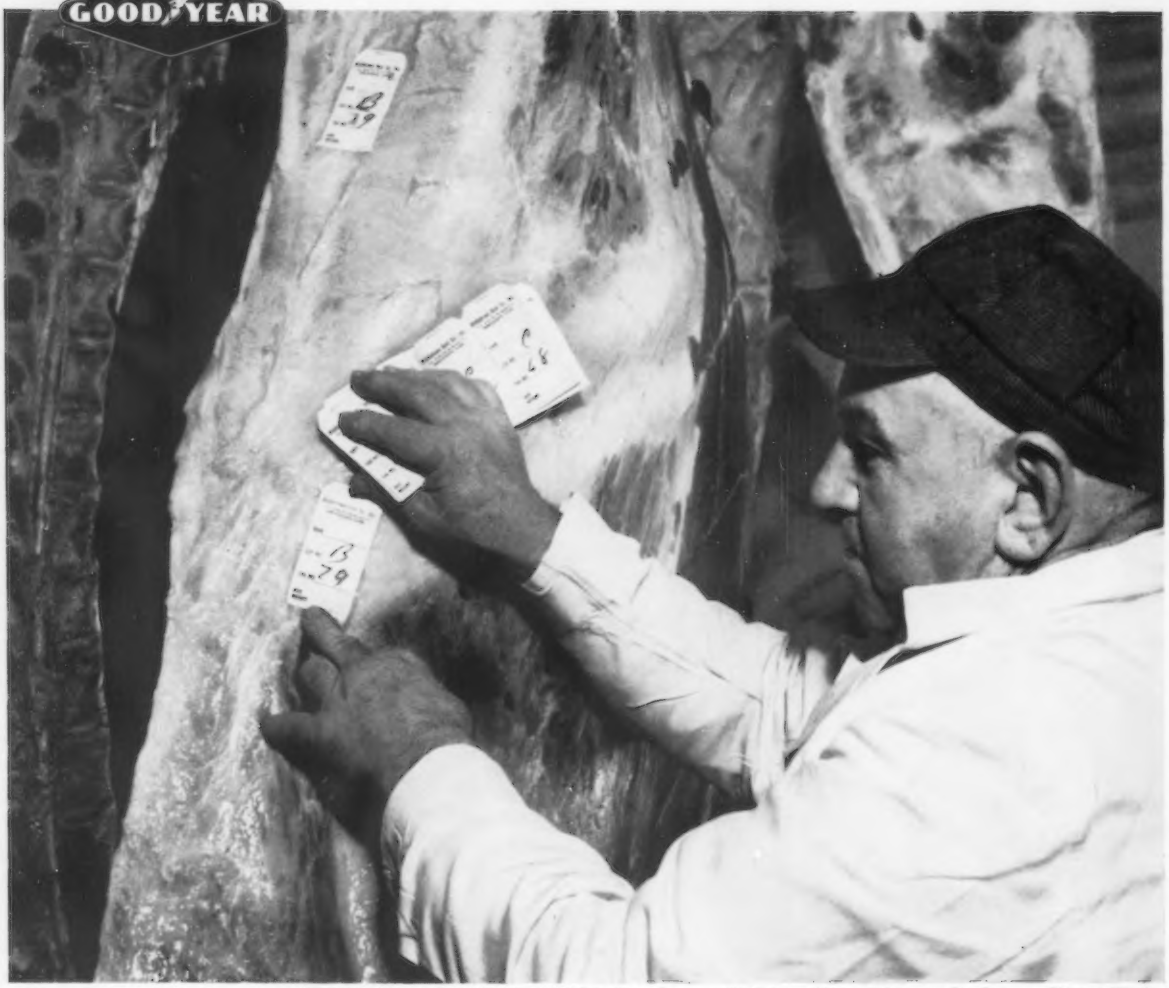

Photograph taken with cooperation of The Sorg Paper Company, Middletown, Ohio, and American Tag Company, Chicago, Illinois.

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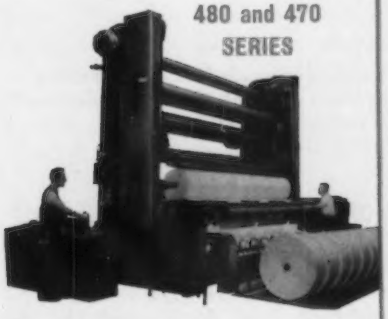

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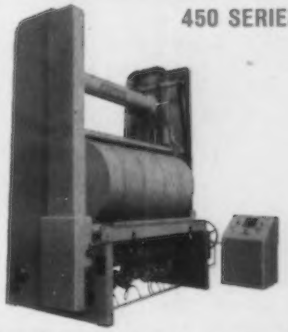

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Week of February 13, 1961
Vol. 145, No. 7

FEATURES OF THE WEEK

Outstanding Features of Fibreboard's New Kraft Board Mill

Chip handling—hot stock screening—continuous digester—172 inch liner board machine are but four of many interesting highlights found in this mill—Paul D. Van Derveer **30**

Evaluation of Optical Properties

A new method for evaluating pigments in paper has been developed which eliminates problems present in the past—M. P. Boland and B. J. DeWitt **37**

Causes and Cures of Chain Drive and Sprocket Ailments

What to do for thirty-seven possible causes of nine major disorders are spelled out in an easy-to-read format—A. H. Sobczak **40**

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Nekoosa Edwards provides automation in its finishing room—Wayne Graham **44**

Swiss Mill Produces Paper Containing Substantial Quantities of Nylon

Our European Editor reveals the details about an interesting development called "Syntosil." **48**

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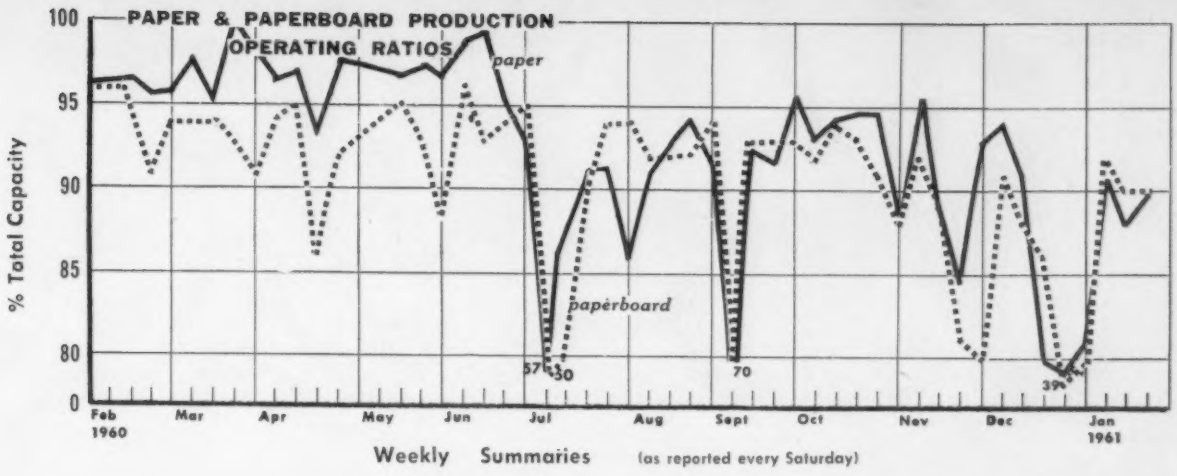

NEWS OF THE WEEK

Keyes Fibre Sales Close to $20 Million . . . Swedes Develop Soft Paper Blankets . . . Far Eastern Paper Situation Grows Acute . . . Knitted Paper—A New Technique, Old Material.

Thilmany Pulp & Paper Advances Two . . . Mead Names Employment Head for Chillicothe Div. . . . Angotti Joins Standard Packaging . . . MacPhee Steps Up at Pacific Coast.

West Virginia Makes ImpacTape Equipment Available on Industry-Wide Basis . . . Textile Paper Products Opens Ala. Plant . . . Independent Group Buys American Paper Specialty . . . Riegel Forms New Folding Carton Sales Group

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REMEMBER THESE DATES

February 20-23	Paper Week in New York
March 26-29	National Paper Trade Ass'n Annual Convention, Waldorf-Astoria Hotel, New York
May 22-24	Technical Ass'n of the Pulp and Paper Industry, 12th Annual Coating Conference, Statler-Hilton, Buffalo, N. Y.

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Results? Drastically reduced downtime. Longer bearing life. A reduction in maintenance costs up to 10%—and more. *This can mean the equivalent of an 8.8% increase in profits from maintenance savings alone.**

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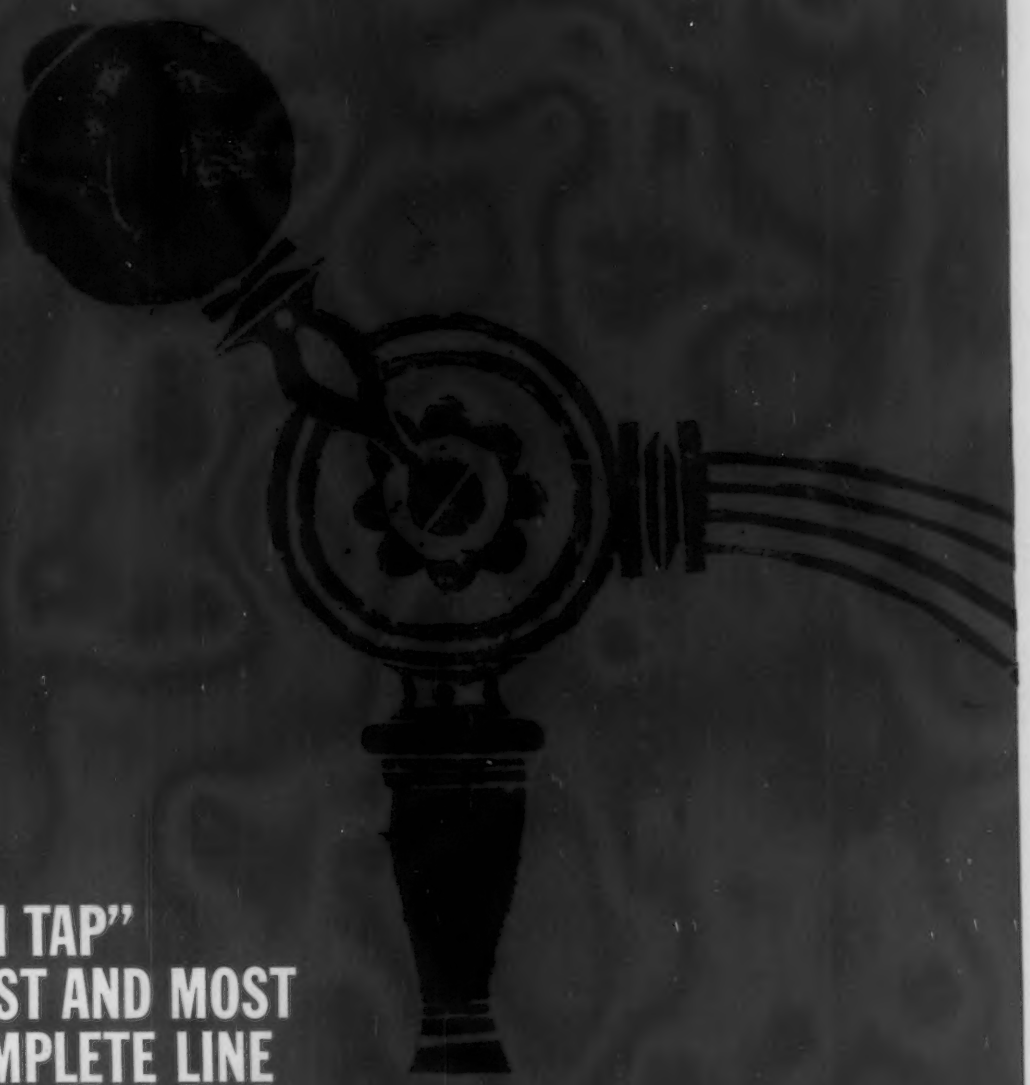

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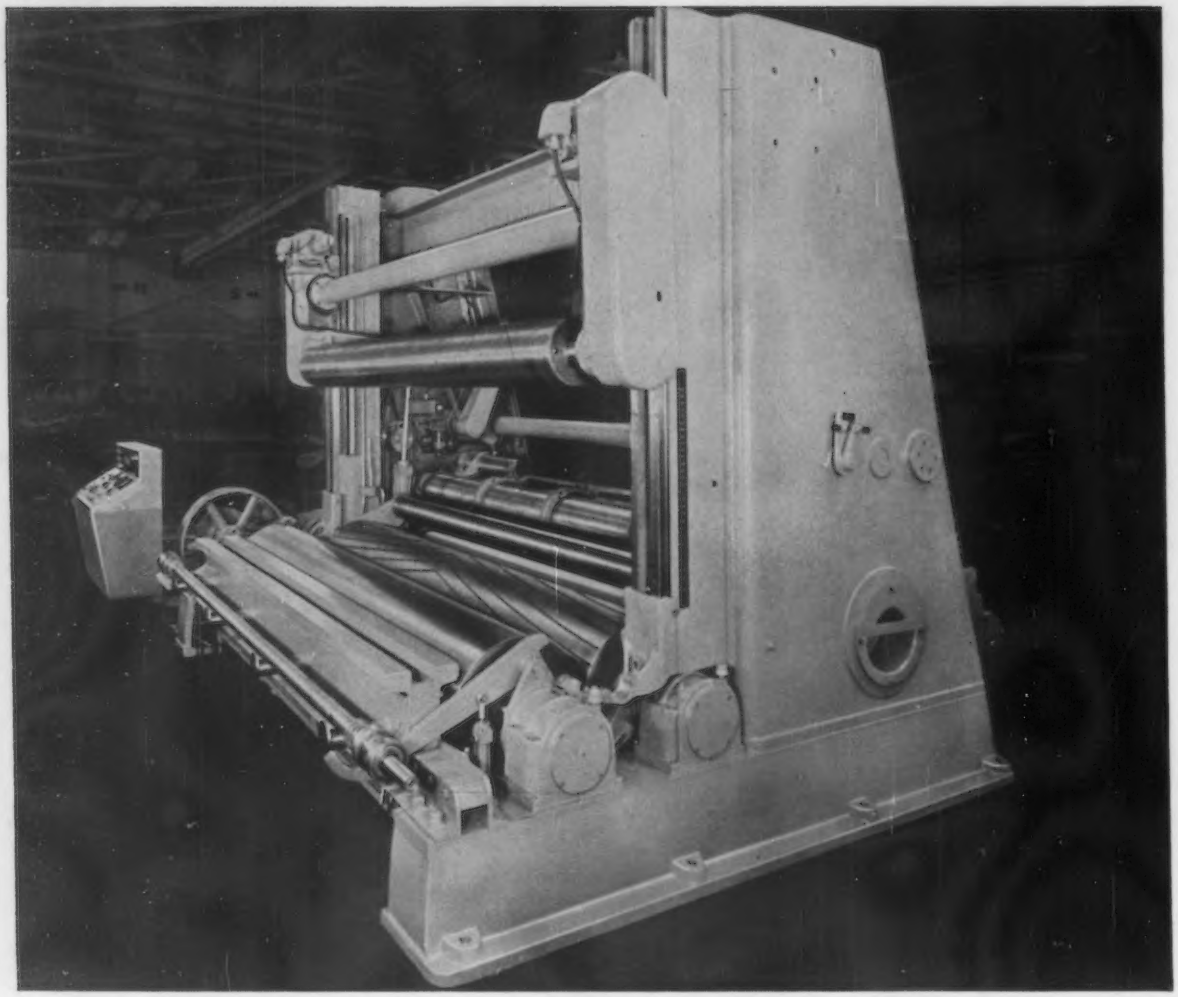

THE SPEEDMASTER

New Langston winder handles large-diameter rolls of both paper and board, speeds up to 7500 fpm

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Proper web tension control is essential for superior winder performance. The Speedmaster is available with either manual, constant or tapered tension, as desired. Details of design vary to suit application requirements. The draw between the rewind drums can also be controlled automatically. As the weight of the roll increases, loading of the rider roll is automatically compensated. And toward the finish of a large roll, the rewind shaft brackets can be power lifted to reduce nip pressure further.

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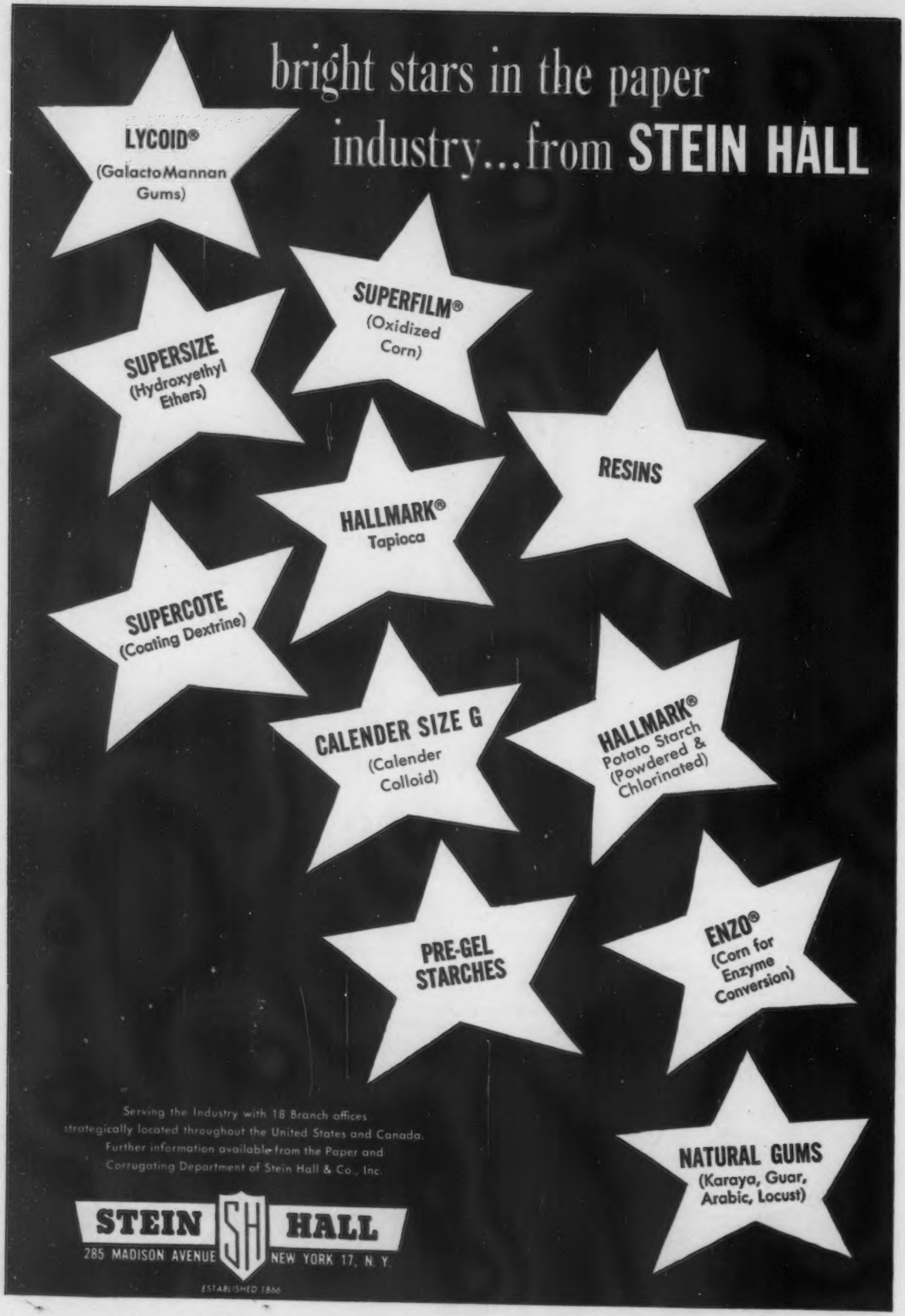
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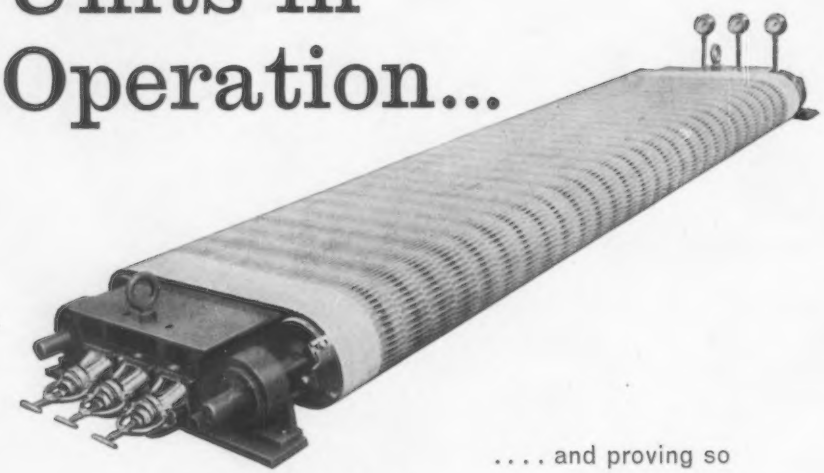

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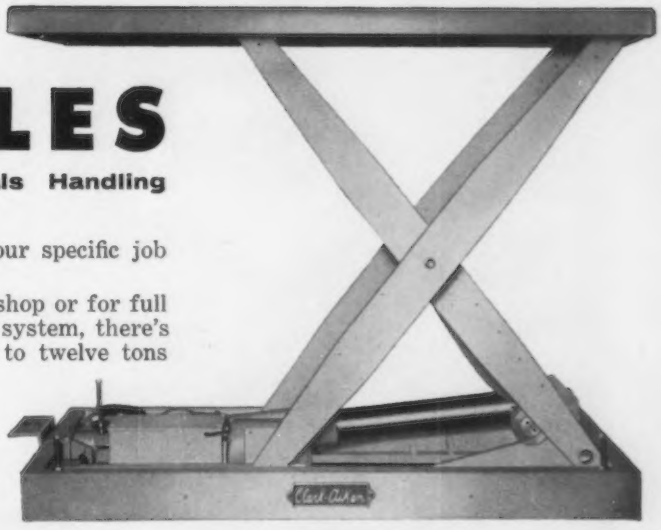

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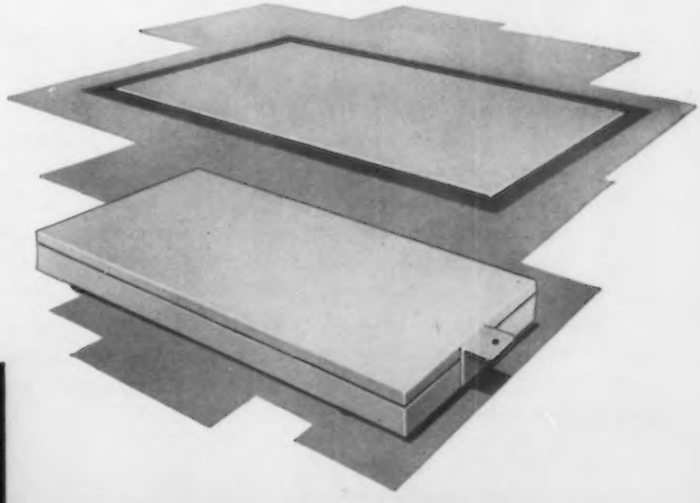

For further information on how Clark-Aiken Lift Tables can help you speed materials handling write today.

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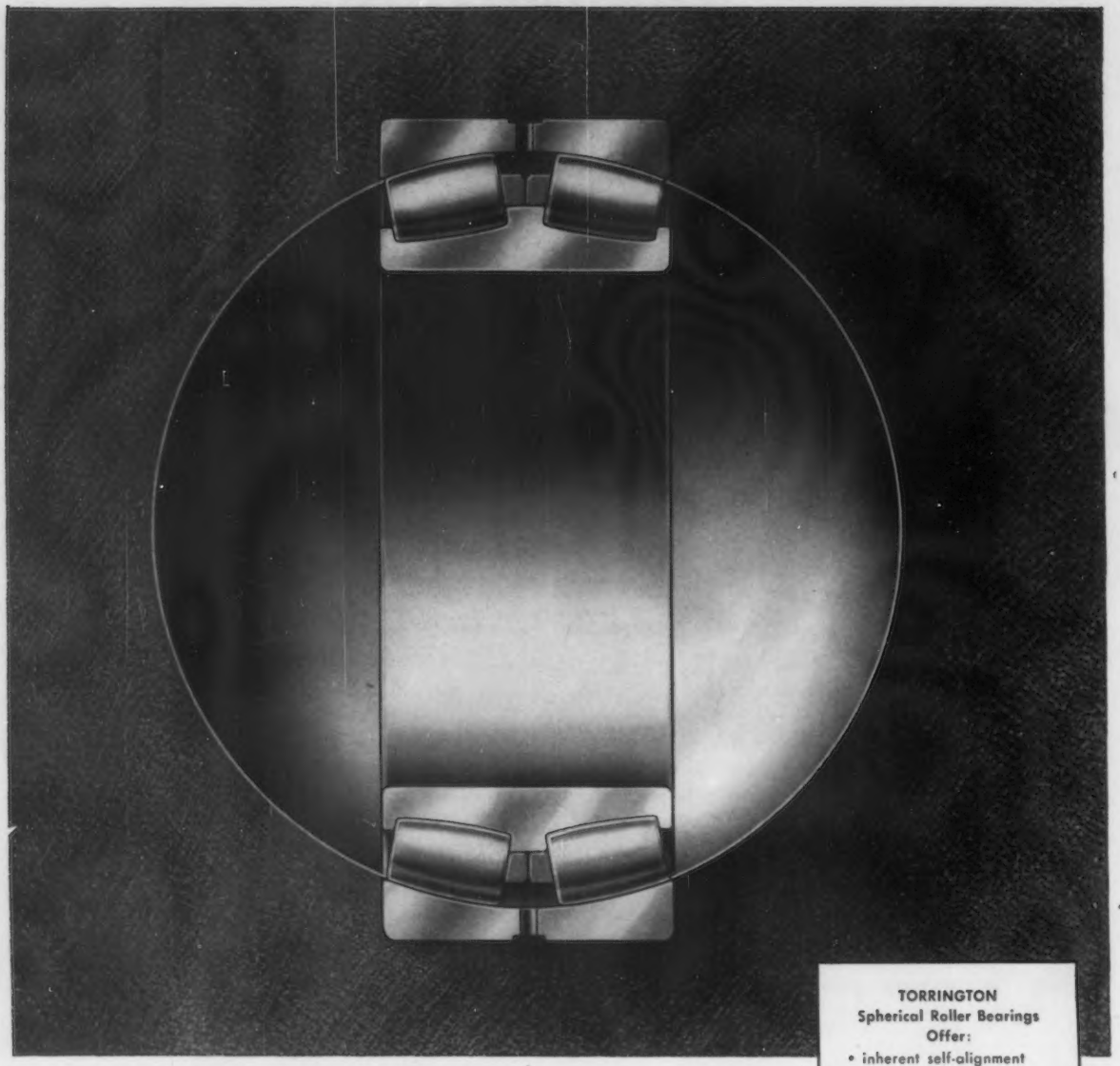

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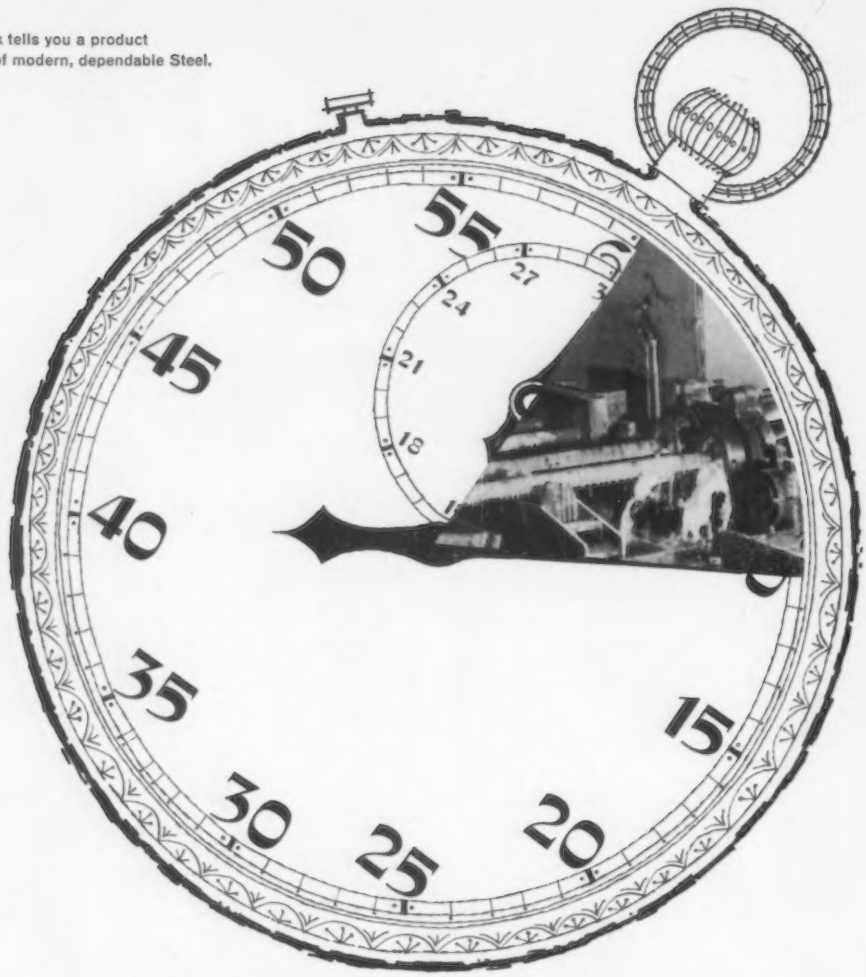

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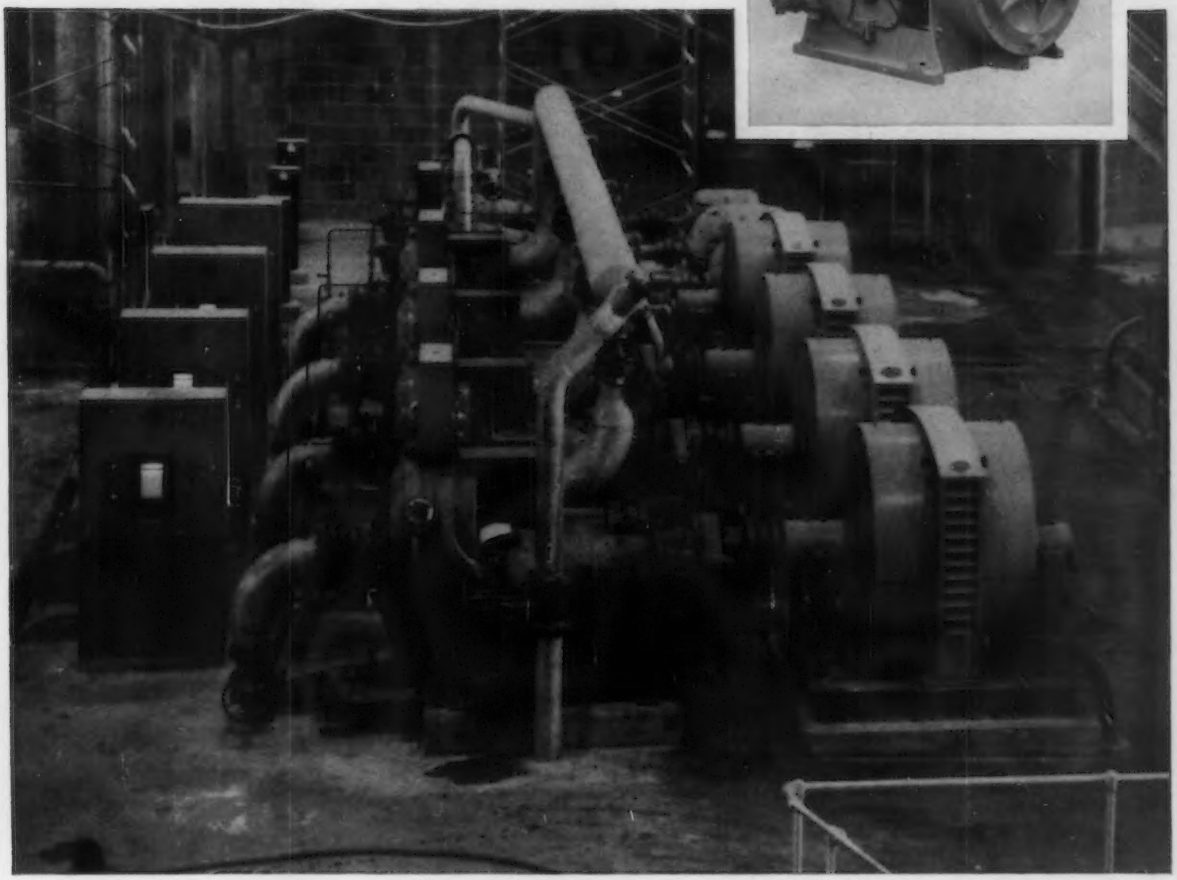
Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors • United States Steel Supply Division • United States Steel Export Company, New York

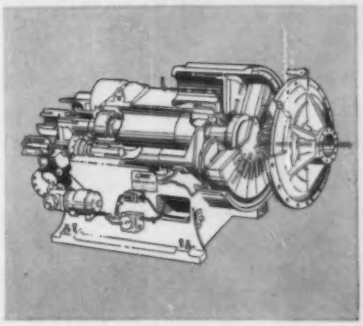
Only 4.4 HP days per ton
Used by Jones Double-D's



. . . at International's Pine Bluff Mill

Production schedules at International's Pine Bluff Mill call for over 500 tons of quality foodboard stock per day — from one 300" Beloit machine. Helping to make this tonnage possible is an efficient battery of four Jones Double-D's operating in parallel for primary refining. Each unit is driven by a 600 HP motor. Working continuously since the mill was put in operation, *each Double-D has been processing approximately 140 tons per day . . . for an outstanding performance rating of only 4.4 HP days per ton* to accomplish almost two thirds of the total primary refining. Important, too, is the fact that Jones Double-D's save on floor space — since each does the work of two ordinary single disc machines.

The experience at International is typical of Jones Double-D's efficiency in many mills. Why not get high production at low HP days per ton — with less floor space in your mills, too? For full details write to E. D. Jones Corporation, Pittsfield, Massachusetts, for Bulletin EDJ-1083.



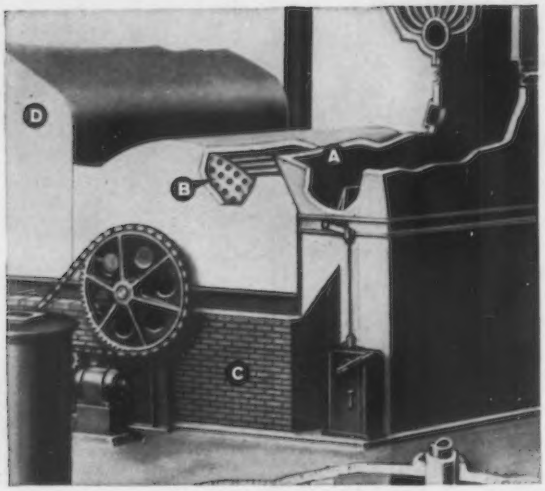
With Jones Double-D's, stock under pressure passes between two single-faced stationary discs and one (center) double-faced rotating disc. This results in precision controlled two stage refining.

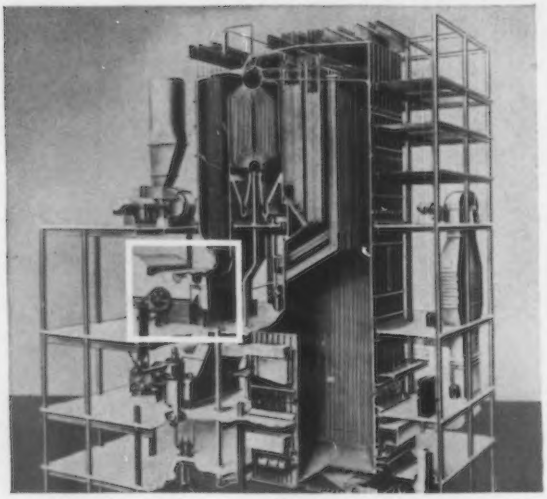
E. D. JONES CORP. member BELOIT group PITTSFIELD, MASS.

Jones

PULP MILL EQUIPMENT AND STOCK PREPARATION MACHINERY

Canadian Associates:
The Alexander Fleck Ltd.
75 Spencer St., Ottawa





Cutaway view of a large C-E Chemical Recovery Unit (lower left) equipped with dual Cascade Evaporators. In the evaporation process (upper left), flue gases, after passing through economizer, are divided by damper **(A)** between upper and lower Cascades. Cylindrical tube bundle **(B)** with sealed tube ends rotates slowly in a bath of hot liquor **(C)**. Hot gases passing over the wetted tubes pick up moisture and leave the Cascade at duct **(D)**. The amount of economizer surface contacting the flue gases is varied automatically — adjusting temperature and evaporation rate.

Why CASCADE Evaporators?

When coupled with an electrostatic precipitator, the C-E Cascade Evaporator affords the utmost in dependable, low-cost chemical collection and liquor concentration. For example . . .

Automatic controls provide exceptional flexibility of operation. With these controls, furnace stability is easily maintained at a high level, even though the density of liquor entering the evaporator may vary widely. And — because the Cascade Evaporator is mechanically simple and efficient — it performs with a minimum of power consumption and personal attention.

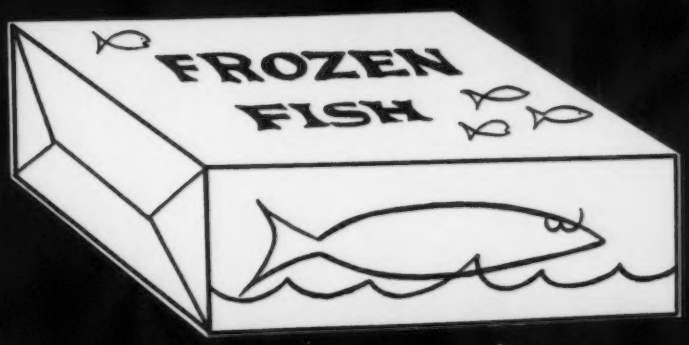
Why settle for less when you specify evaporators? The C-E *Cascade* Evaporator is your most *practical* liquor-concentrating method in the long run. The unit is standard in C-E chemical recovery installations and is recommended for new and existing systems of all makes. Write or call the Paper Mill Division in New York for particulars.

COMBUSTION ENGINEERING

C-267

Combustion Engineering Building
200 Madison Avenue, New York 16, N. Y.
CANADA: Combustion Engineering-Superheater Ltd.

ALL TYPES OF STEAM GENERATING, FUEL BURNING AND RELATED EQUIPMENT; NUCLEAR REACTORS; PAPER MILL EQUIPMENT; PULVERIZERS; FLASH DRYING SYSTEMS; PRESSURE VESSELS; SOIL PIPE



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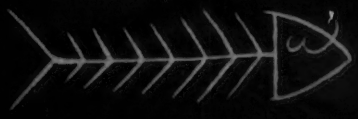
UNITANE® O-110
Titanium Dioxide

Waxed paper wrappings containing Unitane O-110 give products a clean, sanitary look and enhance their eye appeal on the shelf or at the counter. The opacity and sparkling whiteness of O-110 provide an excellent background for the printed message. Ask your Cyanamid Pigments representative for full details.



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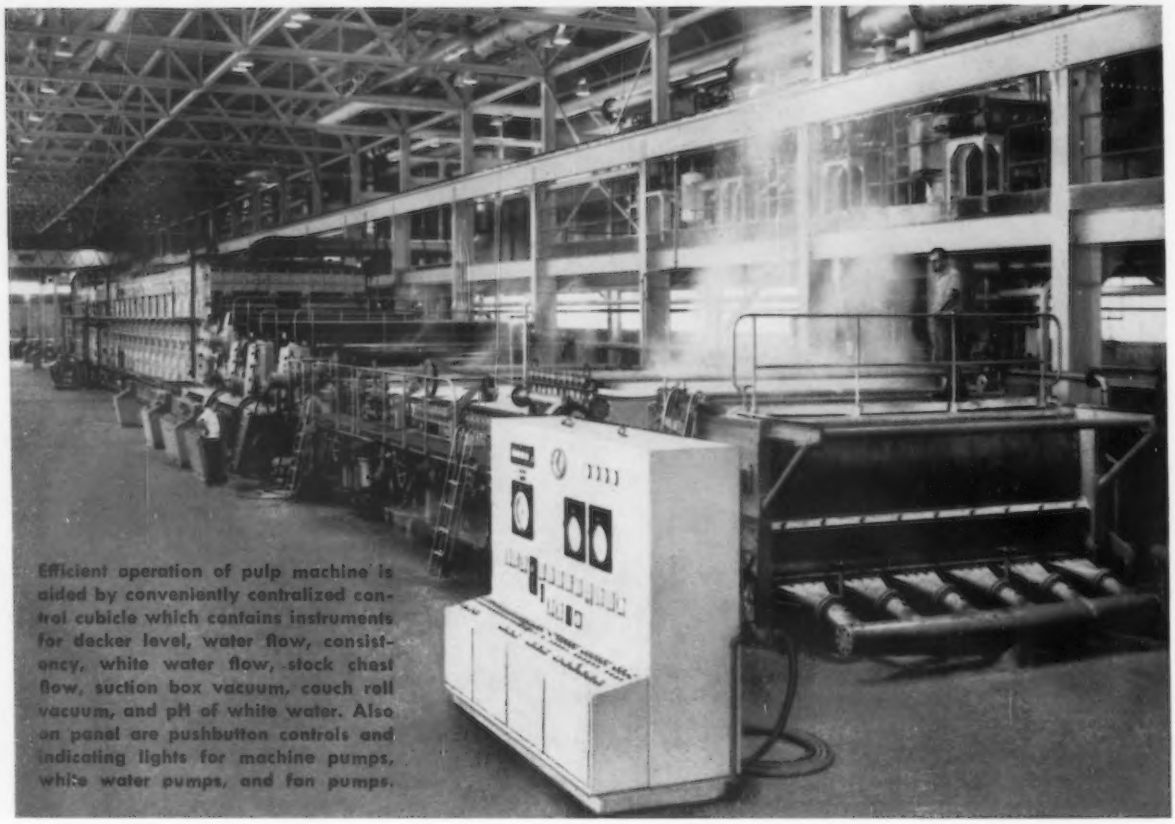
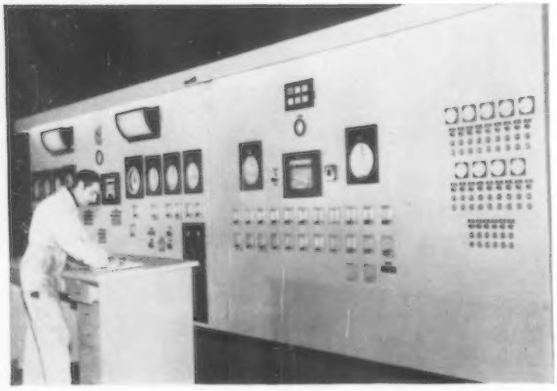


Efficient operation of pulp machine is aided by conveniently centralized control cubicle which contains instruments for decker level, water flow, consistency, white water flow, stock chest flow, suction box vacuum, couch roll vacuum, and pH of white water. Also on panel are pushbutton controls and indicating lights for machine pumps, white water pumps, and fan pumps.

Pushbutton pulping boosts quality and production at new Alaska mill



Controls for recovery boilers and liquor evaporators are grouped on one panel. Throughout the process, all variables are precisely measured and controlled, so that the mill can produce consistently high grade alpha cellulose with maximum economy and efficiency.

Honeywell controls make pulping completely automatic at the new sulfite mill of Alaska Lumber & Pulp Company, near Sitka. Built to supply cellulose to Japan's rayon industry, the mill daily produces 340 tons of top grade dissolving pulp, and is a fine example of the efficiency and quality control that inevitably result from modern instrumentation.

Controls for each application were chosen from the complete line of Honeywell instruments. Cam programmers automatically steam all digesters. In the acid plant, *ElectroniK* instruments record burner temperatures measured by *Radiamatic* radiation detectors, and various temperature and flow controllers regulate liquor evaporators and recovery boilers. In the washing operation, *Tel-O-Set* miniature instruments control shower water flow and filtrate tank level. In the bleachery, ratio controllers accurately add bleach in relation to pulp flow. Automation is complete even to the *Dur-O-Pulse* telemetry system that monitors settling basin level at the filter plant and transmits the information to the turbine room panel.

Your nearby Honeywell field engineer can help you gain the many benefits of custom-designed, modern instrumentation in your own mill. Call him today . . . he's as near as your phone.

MINNEAPOLIS-HONEYWELL, Wayne and Windrim Avenues, Philadelphia 44, Pa.—In Canada, Honeywell Controls, Ltd., Toronto 17, Ontario.

Honeywell

First in Control

SINCE 1885

In Oregon, Stone & Webster goes

ON THE DOUBLE FOR GP GEORGIA-PACIFIC

When Georgia-Pacific Paper Company required doubled production capacity from its new Kraft mill at Toledo, Oregon, Stone & Webster engineers were called upon to design the expanded facility. To facilitate speed and flexibility the design work was undertaken by a Stone & Webster task force set up at the project site.

Today the mill can produce 605 tons per day ... 430 tons in linerboard, 175 tons in paper. Working closely with Georgia-Pacific's own people, Stone & Webster Engineering Corporation completed the job in less than 12 months, remaining well within both cost and time estimates.

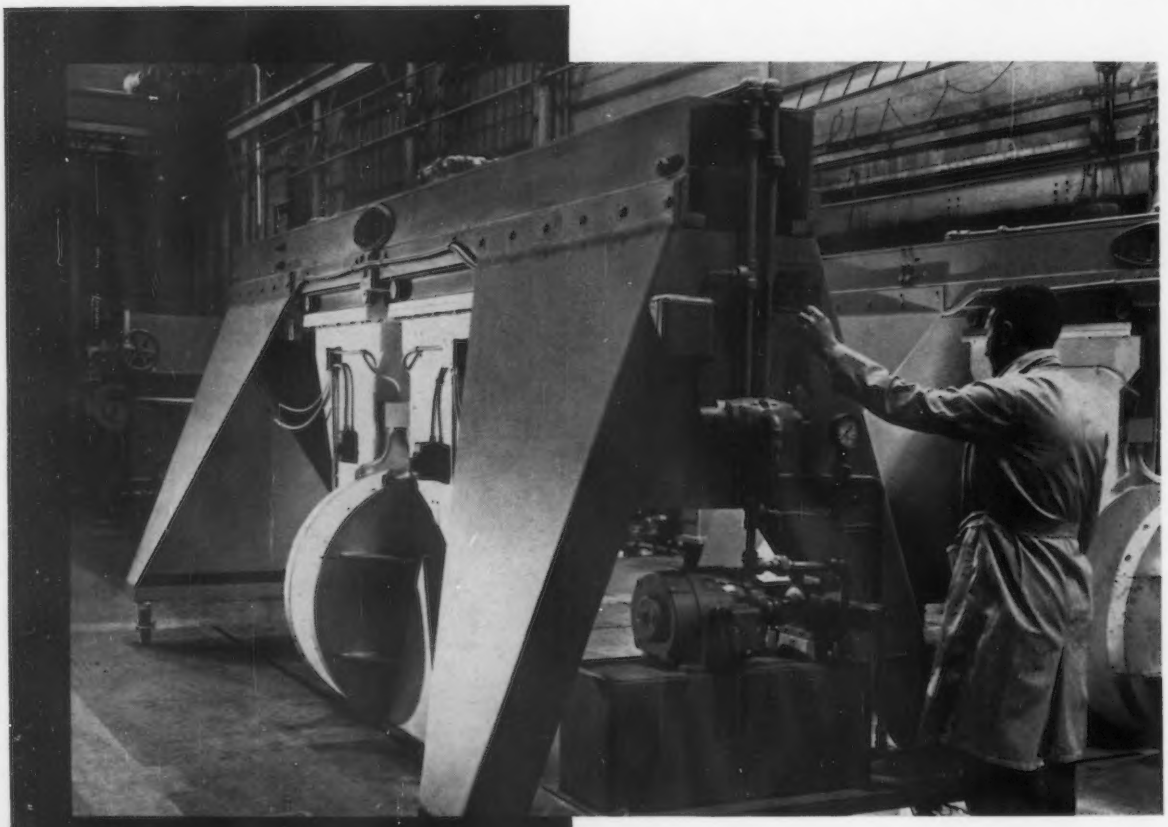
Here again, the accumulated experience and varied engineering skills available at Stone & Webster have added extra economy and profitability to a client's project. To learn how we can serve you, please call or write our nearest office.

STONE & WEBSTER ENGINEERING CORPORATION

A Subsidiary of Stone & Webster, Inc.

New York, 90 Broad Street Boston, 49 Federal Street Chicago Houston San Francisco Los Angeles Seattle Toronto Calgary

at Valley we make it
our business to develop equipment
to help you **REDUCE YOUR COSTS**



Newly designed Valley Portable Roll Header with electrically heated heads. This mobile unit can "head" rolls at any number of locations, thus saving costly roll handling and moving operations. This is another example of a specially designed and engineered piece of equipment to meet the requirements of a customer and to aid in reducing costs.

in more and more
finishing departments,
as throughout the paper mill,
it's equipment by. . . .

VALLEY

IRON WORKS CORPORATION
Subsidiary of Allis-Chalmers Manufacturing Co.
Appleton, Wisconsin

West Coast Representative: E. A. Berry, P.O. Box 958, Longview, Washington
Canadian Representative: Pulp and Paper Mill Association Ltd., P.O. Box 850, Station "O", Montreal 9, Quebec

Which of these 3 products and services can you use from BECCO?

"Enclosing $1.00 — Send Patent License"

Well, perhaps there's a little more to your gaining use of Becco patents than just mailing your dollar in, but not much more. And certainly, no more money. The $1.00 really does cover it.

Becco has lots of patents, granted as a result of innovations in the use of Hydrogen Peroxide and other Peroxygen chemicals developed in Becco's Research Laboratories. But they don't do us a whole lot of good locked tightly in our safe. So, we long ago adopted the following policy:

If one of our patents can help you, we'll be glad to license the rights to you **perpetually,** for just one dollar. You get a nice certificate, incidentally, to cover the legalities, but more important — you also get free our complete engineering help in setting up your process, handling the material, maintenance, etc., etc.

What do **we** get? You as a **customer** — we hope — but there's no obligation on your part. Just seems to work out that way, though — when we know enough about a particular peroxygen to hold a patent on its use, chances are we've also learned enough to produce it purer than anyone else. You benefit from this; we do, too.

Use the coupon below to ask for a Sales Engineer — or our list of patents — that may help you solve an important problem.

BECCO fmc

BECCO CHEMICAL DIVISION, FMC
161 East 42nd Street
New York 17, N. Y.

Dept. PTJ-F

Gentlemen:

Please send your list of patents available on the use of

- ☐ Hydrogen Peroxide
- ☐ Peroxygen Chemicals
- ☐ Persulfate Chemicals
- ☐ Please have a Sales Engineer call.

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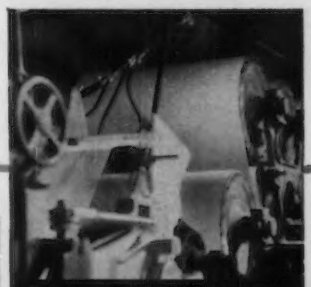

How BRIGHT Is BRIGHT?

That's a hard question to answer. It depends on how the pulp is treated.

Trouble is, paper can show an 86 level at the layboy, but by the time the paper is delivered, this has dropped to 82 or lower. With conventional bleaching methods, that is.

Many chemical pulp producers have found the answer to this problem in Becco's Dryer Steep Bleaching Process (patented, but licensed perpetually for one buck). Applied by means of spray pipes across the pulp sheet ahead of the dryers, Becco Hydrogen Peroxide increases brightness permanence and bleaches in transit. Often, in fact, an 86 layboy level **improves** to 88 by delivery time.

This is just one example. Becco has a vast amount of technical knowledge compiled from 31 years of experience with **all** types of pulp. If **you'd** like help with your pulp, free of any obligation, let us know with the coupon below.

BECCO fmc

BECCO CHEMICAL DIVISION, FMC
161 East 42nd Street
New York 17, N. Y.

Dept. PTJ-C

Gentlemen:

We **would** like help with our pulp. Please have a Becco Sales Engineer call.

NAME_____

FIRM_____

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ZONE____ STATE_____

Problems in handling Hydrogen Peroxide

Becco's Four-Fold Engineering Service Program—offered free—includes:

1. Comprehensive survey of your facilities.
2. Specific proposal with recommendation of proved equipment and where it is obtainable.
3. Installation supervision by Becco.
4. Periodic inspection and permanent service.

Can you use this free Becco help, based on more years of experience with bulk handling of H_2O_2 than any other manufacturer? Use the coupon to let us know.

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Gentlemen:

Please tell me more about your Four-Fold Engineering Service.

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Conserve water with Lodding Self Cleaning Showers

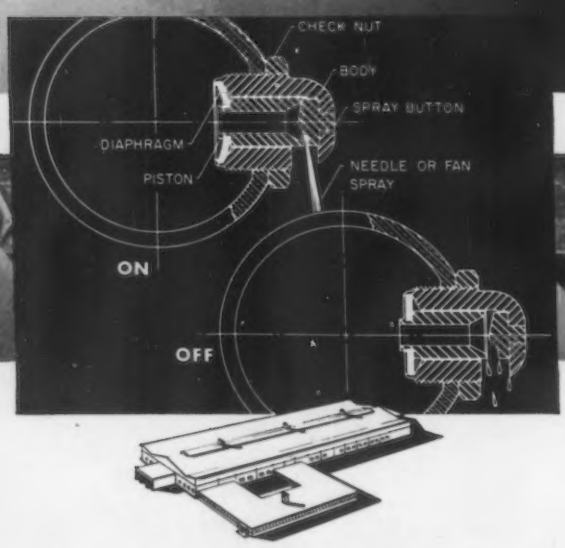
In mill after mill Lodding Showers are conserving water — cutting operating costs — performing effectively.

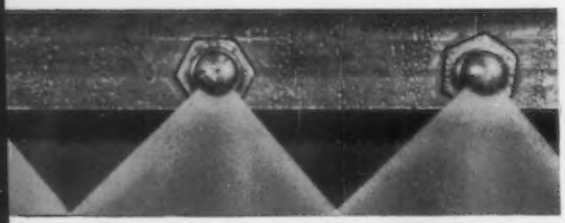
In showers it's the nozzle that counts. And Lodding Nozzles have been engineered to give you the greatest possible showering efficiency, whether your system uses fresh or clarified white water.

Lodding Nozzles are designed with a built-in, sealed piston. In operation, pressure of the water forces the piston against the spray button, which is precision-milled to create the exact spray pattern desired — from an 80° fan to a needle stream.

As particles become lodged in the nozzle, the piston oscillates and automatically frees them. When the water is shut off momentarily the piston retracts. After the water is turned on again there is a brief period before the piston resumes contact with the spray button. During this interval larger particles are flushed from the nozzle.

It will pay you to investigate all the advantages of Lodding Self Cleaning Showers. Lodding, or one of our sales representatives, will be pleased to tell you more about them.





LODDING
Engineering Corporation
AUBURN, MASSACHUSETTS

Trends

Mills Rates Good in January

During January the paper mills ran at close to 88% of capacity and paperboard mills 92%. This compares with 96.5% and 92% respectively for January, 1960. Note that January figures are depressed by the New Year's day holiday.

Scandinavians Raise Kraft Paper Prices

A general increase of £2 ($5.60) a ton in the export price of kraft paper was announced recently by Scandinavian mills. This increase matches up with a slightly earlier increase of £2 a ton in the price of unbleached kraft pulp in Europe.

Market Pulp Off in U.S. Big Rise in Exports

Total U. S. wood pulp production in 1960 was 4% above the previous year according to the just released report of the U. S. Pulp Producers Assn. Shipments of U. S. pulp to the domestic market in 1960 was off 5% from 1959 but exports were up 81%. The change in export shipments in 1960 versus 1959 by areas were; Canada +2%, Latin America +36%, Europe +85% and Asia, Africa and Pacific areas +158%. Europe consumed about 60% of the exported U. S. pulp.

School Supplies Market to Boom

The coming rise in school spending will lift educational sales to a record high, predicts Dun's Review and Modern Industry in its February issue. In "The Booming Education Market," first of a new series on Growth Markets of the '60's, the Dun & Bradstreet business magazine reports that an estimated 55 million pupils will be cramming public, parochial, and private schools by 1970.

Printing Paper Distributors Boost Sales 4% in 1960

Paper wholesalers distributed a record breaking $3,142,004,000 worth of paper and paper products in 1960, according to O. Glenn Leach, executive secretary of The National Paper Trade Ass'n. Mr. Leach said distributors of fine and printing papers increased sales volumes by 3.9% in 1960 to a record of $1,472,829,000. Distributors of industrial and wrapping papers also reached a new high at $1,669,175,000, an increase of 0.6% over 1959. N.P.T.A.'s 1,100 members account for more than 80% of printing and industrial papers distributed through wholesalers.

Concentration up to 16-18%!

Heat Recovery
Chemical Recovery
Storage Stock Thickener
Bleach Stock Thickener
Asphalt Dispersion Pre-thickener
Other Thickening Operations

Rice Barton's Water Extractor dewaters pulp and paper stocks from 3% to these surprisingly high solid values. Over 50 recent installations throughout the world are actually attaining these final consistencies at capacities for economical operation.

Write for specific performance data for your dewatering application.

- Simple operation—capacity and consistency easily controlled
- Low original investment and inexpensive to operate
- Small floor space—height 8′ 4″, width 4′ 3″, depth 4′ 6½″
- Output approximately 3 tons per hour

The Water Extractor is manufactured in other sizes for capacities required

RICE BARTON Corporation, Worcester, Mass.

Fourdriniers • Press Sections • Dryer Sections • Calenders and Supercalenders • Reels • Winders • Head Boxes • Size Presses • Breaker Stacks
Differential Draw Control and Cone Pulley Drives • Pulping Equipment • High Velocity Air Dryers • Trailing Blade Coaters • Fibre-Flash Drying Systems

PAPER TRADE JOURNAL

WEEK OF FEBRUARY 13, 1961

Keyes Fibre Sales Close to $20 Million

Keyes Fibre Co. of Waterville, Me., leading manufacturer of molded paper products in the United States, reports sales of $19,520,528 for 1960 in its consumer, institutional and packaging products. The Keyes 1959 sales were $18,246,807.

A highlight in the affairs of the company during the past year is a proposed new pulp molding plant which the company is constructing in Sacramento, Calif. The new 170,000 square foot plant will have facilities for substantially increasing Keyes sales output of paper plates and dishes, meal and product prepackaging trays, and interior packaging.

Swedes Develop Soft Paper Blankets

Throw-away paper blankets replacing conventional dust and germ collecting woolen blankets for hospitals are a new Swedish development.

Consisting of 20 layers of soft crepe paper, the blanket is put inside a linen sheet cover. It is said to be as warm and light as a down covering. When the patient leaves the hospital, or at regular intervals for longtime in-patients, the paper blanket is removed and put into a sealed paper bag for burning. The tests carried out to date are said to have proved that the blanket is durable enough and easy enough to handle to meet all practical requirements.

While the blankets tested so far contain 20 layers of paper, it is estimated that 10 layers would be sufficient for a light blanket for summer use, while 30 layers would ensure an extra-warm blanket for special purposes.

The paper blanket has been developed and patented by Nyboholms Bruk, near Gothenburg, where experiments are now going on with a plastic-covered pillow case of paper. The cost of the new blanket is said to be moderate, about Kr.2 (40 cents) for a large blanket and Kr. 0.50 (10 cents) for a child's blanket. These prices may be reduced considerably.

Far Eastern Paper Situation Grows Acute

Consumption of paper and paperboard per person in the Far East averages out to 9 pounds per year as against 405 pounds per person in the United States. This was a dramatic indication of where the pulp and paper industry of the Far East is, and its potential for growth, as reported by S. T. Han, faculty member of The Institute of Paper Chemistry at Appleton, Wis., in a seminar on the paper industry in the Far East, for the Institute staff and students. Mr. Han returned recently from a Far East trip.

His Institute seminar also showed there is a vast difference in the state of the pulp and paper industry in different parts of the Far East. For instance, while average consumption per person per year was only 2 pounds in South Asia, in East Asia, Japan's 1959 average was 88 pounds, well above the world's average of 54.

This uneven production and consumption of paper within the Far East is further apparent by the fact that if Japan's and China's output were pulled out, almost 90 per cent of the entire Far East's paper production would disappear.

If nothing were done about it, this difference within the Far East of use of paper could get worse. This is borne out by the fact that while South Asia increased its use of paper by only 150 per cent in the last ten years, East Asia, which includes Japan, increased its consumption per person by 650 per cent.

Rothesay Going Ahead with Newsprint Mill Plans

Rothesay Paper Corp. newsprint mill project in St. John, N.B., has not been abandoned and prospects for the new site are good, according to information from W. L. Forster, president of Sogemines, Ltd., Montreal, the parent company. Mr. Forster said the company "is confident that, in the near future, we shall be able to give firm dates for commencement of construction and production."

He explained that the original site for the Rothesay newsprint mill in St. John, N.B., had been "expropriated" by act of the New Brunswick Provincial Government (see P.T.J. January 16, 1961) but that the Federal Government has entered an injunction on grounds the area belongs to Canada and cannot be expropriated by a province. Meantime, the Rothesay group is actively interested in procurement of an alternative site nearby, and has no reason to suppose that one of the two sites will not be settled in the near future.

Paper and Paperboard Production

The American Paper and Pulp Association reported the ratio of the United States paper production to mill capacity for the week ending January 28, 1961, at 89.7 per cent, compared with 88.9 per cent, revised, for the preceding week. The ratio was 96.3 per cent for the corresponding week a year ago. The capacity base was raised 3½ per cent as of January 1, 1961, over that used in the last six months of 1960.

The National Paperboard Association reported the paperboard production ratio for the week ending January 28, 1961, at 90 per cent, compared with 90 per cent for the preceding week and 97 per cent for the corresponding week a year ago.

(Detailed Statistics on page 62)

Maine Summer Institute Plans Announced

Complete plans for the three-week course in pulp technology at the University of Maine, July 10-27, have been announced by Professor Lyle C. Jenness, director of the six-week Pulp and Paper Institute which is to be held at that institution under the sponsorship of the University of Maine Pulp and Paper Foundation and the University.

John C. W. Evans of PAPER TRADE JOURNAL will give the opening lecture. Seven specialists from manufacturers are to participate in this three-week program as follows: N. P. Wardwell, secretary-treasurer of Carthage Machine Co.; W. David Kerr, chemical engineer of Fraser Paper, Ltd.; Vincent F. Owens, assistant general sales manager, Combustion Engineering Co.; Robert W. Doe, pulp mill superintendent of West Virginia Pulp & Paper Co.; Frederick G. Perry, Jr., of A. D. Little Co.; Edward M. Root, sales manager of Black-Clawson Co.; and D. D. Uong, senior vice president of Fitchburg Paper Co.

In addition, the following persons are to serve as instructors on this subject: Professors Fay Hyland, Botany Department; Harold Young, Forestry Department; Irwin Douglass, Chemistry; and Lyle Jenness, Chemical Engineering, all members of the University of Maine faculty. Visiting teachers will be Professor F. W. O'Neil, chairman of the Department of Pulp and Paper Technology at the College of Forestry, Syracuse University; and W. H. Rapson, Professor of Chemical Engineering at the University of Toronto.

The final day of the course will be devoted to a panel discussion of pulp mill management with William H. Chisholm, president of Oxford Paper Co.; Manuel C. McDonald, president of Great Northern Paper Co.; and Ralph H. Cutting, president of Keyes Fibre Co., serving as the panelists.

Immediately following the conclusion of the pulp technology course, a three-week course will open July 31 which will be devoted to paper technology.

The marked success of the first institute held last year at the University led the directors of the University of Maine Pulp and Paper Foundation to vote to continue the institute so long as there is need for training manpower by this means of intense instruction.

Knitted Paper—A New Technique Old Material

Many new and diversified uses for paper are promised by the recent introduction of a virtually 100 per cent efficient method of converting paper into a knitted product. Holding the key to the process and bigger profits for the paper industry is Ronald H. Marks, president of a meat-packing equipment manufacturing firm in Dallas, Tex. Starting with an idea for making wide mesh bags for smoking hams, he has developed a process and equipment for slitting, twisting, winding and knitting paper into many varied forms.

Mr. Marks's process has already been proven commercially at his Dallas plant which is in regular production of the knitted material. Utilizing paper direct from the paper machine, the process is low in labor and manufacturing costs and equally important, there is no wastage of raw material. In the process a roll of paper is slit into narrow widths (as small as 3/16 inch), then treated, twisted, and wound on bobbins. Second stage of the process is to knit the material in a seamless, tubular form. An infinite variety of fabrics can be formed by varying the kind of paper, the width of paper, or by combining with other fibers on the knitting machine.

Primary uses for the knitted material, predicts Mr. Marks, will be as reinforcement for plastics, and in the fields of building construction and packaging.

Potential uses, some of which are already a reality include: backing for carpets, curtains, draperies, substitute for jute, replacement for burlap, heat shielding material for missiles, and eventually for clothing.

Depending on the end product a wide range of papers can be utilized as raw material in this process, from tissue to 70 lb. kraft. The knitting process adds greatly to the strength of the paper and some assemblies have given a Mullen test exceeding 300. Advantages of the knit material besides dry strength includes wet strength, durability, flexibility and its very low manufacturing cost, only fractionally higher than the cost of paper itself.

About a dozen textile and other firms in the U. S. and Canada have acquired licenses to Mr. Marks' process and are actively exploring the commercial possibilities of knitted paper fabrics. Licensing negotiations are also underway with companies in France, Brazil and England. Among the U. S. licensees are Cone Mills Corp., Bigelow-Sanford Carpet Co., Armstrong Cork Co., Dan River Mills and Continental Can.

CPPA Technical Section Picks Summer Meeting Theme

The 1961 Summer Meeting of the Technical Section will take the form of a conference on Chemical Pulping and Bleaching at Saranac Inn, N. Y., on June 7, 8 and 9. The decision to hold a conference on a specific theme was taken in view of the many favorable comments received on the format of the 1960 Summer Meeting.

E. L. Neal, president and general manager of Gaspesia Sulphite Co., Ltd., and 1961 chairman of the Technical Section, will be general conference chairman. A Program Committee has been formed to plan the program under the chairmanship of W. H. Bush, Dryden Paper Co., Ltd., chairman of the Alkaline Pulping Committee and includes L. N. Stanners, Anglo-Canadian Pulp & Paper Mills, Ltd., chairman of the Sulphite Committee, and W. H. Rapson, University of Toronto, past-chairman of the Fundamental Research Committee.

Change in Date Announced For TAPPI Coating Conf.

The date of the 12th Annual TAPPI Coating Conference, Statler Hotel, Buffalo, N. Y., has been set ahead to May 8 through 10. The change in date was necessary in order to have sufficient room for the conference.

The hotel has advised that the reservations they now hold for the original date will be changed and notifications will be sent to those persons having reservations.

IPC Alumni Ass'n. to Meet

The Institute of Paper Chemistry Alumni Assn. will hold its annual dinner at the Belmont Plaza Hotel in New York City, February 20. A social hour will start at 4:30 p.m. Dinner will follow at 6 o'clock.

PAPER PEOPLE

R. E. Strauss

M. M. Coan

Thilmany Pulp & Paper Advances Two

Two promotions in the manufacturing division of Thilmany Pulp & Paper Co., Kaukauna, Wis., have been announced by C. L. Dostal, vice president for manufacturing. Robert E. Strauss, formerly chief industrial engineer, was named production services manager. Marlin M. Coan succeeded Mr. Strauss as head of industrial engineering.

Mr. Strauss has served as chief industrial engineer of the firm since joining it in 1954. In his new assignment he is responsible for planning and scheduling, traffic and material handling. Mr. Dostal described the move as being aimed at improved customer service.

Mr. Coan, a 1952 graduate of the University of Wisconsin, has been employed in the company's industrial engineering department since 1959.

Mead Names Employment Head for Chillicothe Div.

William Buckingham has been named employment manager of The Mead Corp.'s Chillicothe Division. He replaces Roger Search who has been appointed employment and training supervisor for the Mead Packaging Division, Atlanta, Ga.

Angotti Joins Standard Packaging

Samuel A. Angotti, who resigned last year as a KVP Sutherland Paper Co. vice president, has been appointed a vice president of Standard Packaging Corp., New York.

R. Carl Chandler, board chairman, has announced that Mr. Angotti will be responsible for Standard's Converting and Packaging Group, which consists of 13 operating divisions and subsidiaries.

MacPhee Steps Up At Pacific Coast

N. L. MacPhee has been promoted to administrative assistant by the Pacific Coast Paper Mills, Bellingham, Wash.

Mr. MacPhee, formerly new-product-development manager, now will be responsible for product research and development, production planning and export sales.

He is a 1954 graduate of the University of Washington.

Three Win Promotion At C-Z Camas Mill

Three employes at Crown Zellerbach's Camas mill have won promotions. They are John A. Betts, machine and heater room maintenance supervisor; James S. Wrong, paper machine maintenance foreman; and Howard Z. Rondeau, kraft mill maintenance supervisor. Mr. Betts is being transferred to Antioch, Calif., as general maintenance superintendent. Mr. Wrong is being promoted into Mr. Betts position as supervisor of paper machine and heater room maintenance. Mr. Rondeau now becomes paper machine maintenance foreman.

Baldwin Joins Chesapeake As Maintenance Supt.

Harrison P. Baldwin, former engineering supervisor of East Texas Pulp and Paper Co., Evadale, Tex., has joined The Chesapeake Corp. of Virginia in the newly established position of maintenance superintendent.

In 1937 Mr. Baldwin joined Hammermill Paper Co. as a draftsman and rose to planning engineer and assistant superintendent of maintenance. In 1957 he became engineering supervisor with East Texas Pulp and Paper Co. He began his duties with Chesapeake in January.

G. O. Hamersley

Hamersley Appoints Assistant Treasurer

The management of The Hamersley Manufacturing Co., Garfield, N. J., has announced that a fourth generation Hamersley, George O. Hamersley, was appointed assistant treasurer of the firm and also a member of the board of directors.

Cain to Manage CDF Purchasing

Frank Allen Cain has been appointed manager of purchasing for Continental-Diamond Fibre Corp., Newark, Del.

Mr. Cain started his career with CDF in 1929 as an assistant purchasing agent in Newark, Del. He has been assistant purchasing manager for the past six years.

Robert Halder

D. I. Pittsley

Fort Howard Names Daley District Sales Mgr.

Fort Howard Paper Co., Green Bay, Wis., has announced the promotion of A. J. Daley to the position of Western district sales manager. A veteran of 30 years in the paper business, Mr. Daley started with Fort Howard in 1930 as a sales representative in the Chicago area, moving to Gary in 1933 with responsibility for the Michigan-Indiana territory.

Wausau Paper Mills Advances Personnel

Robert Halder has been appointed purchasing agent for Wausau Paper Mills Co., at Brokaw, Wis.

Mr. Halder started with Wausau in 1945 following 5 years of service in the U.S. Marine Corps. For the past 13 years, he has been safety director and prior to that worked in the mill's maintenance department.

Donald I. Pittsley, has been appointed safety director succeeding Mr. Halder. Mr. Pittsley has been with Wausau Papers for over 10 years, working in the engineering department and other jobs until 1958 when he was made timekeeper. He held this position until his promotion to safety director.

S. P. Higgin

Westvaco Advances Two at Roanoke

West Virginia Pulp and Paper Co. has named James R. Ballengee assistant to the paper mill superintendent and Phillip E. Forbes project leader for the technical service department at the Roanoke plant.

Gulf States Boosts Two at Tuscaloosa

Changes in Gulf States procurement division have boosted Charles E. Brown to procurement superintendent, Tuscaloosa, and S. M. John to purchasing agent.

Mr. Brown's newly created job heads the purchase of all the Tuscaloosa mill's pulp wood requirements and sees that other purchasing functions for that plant are performed. He will be directly responsible for the purchase of the Tuscaloosa mill's supplies. This includes filling all machinery requirements and buying all other raw materials except wood.

Mr. Brown moved from purchasing agent to his new position. He joined Gulf States Paper in 1950 as an industrial forester in the forestry division. In 1955 he became purchasing agent.

Mr. John has been a company employee since 1958. Before this promotion he was the senior engineer responsible for writing all contracts for company construction projects.

SFI Appoints Fates, Rehfeld as V-P's

Appointment of H. L. Fates, New York financial executive, as vice president in charge of finance for Southwest Forest Industries, Inc., has been announced. Mr. Fates will make his headquarters in the Phoenix offices of Southwest, which is a manufacturer and distributor of wood and paper products.

At the same time the election of Robert W. Rehfeld as vice president and treasurer of the company, was announced. He has been Southwest's treasurer since 1951.

President Named for St. Regis International

St. Regis Paper Co. announces that Spencer P. Higgin has been named president of the newly formed St. Regis International Corp. He will be responsible for foreign operations of the company and its subsidiaries outside of the United States and Canada.

Mr. Higgin has served for the past three years as president of American Sisalkraft Co., now a division of St. Regis.

OBITUARIES

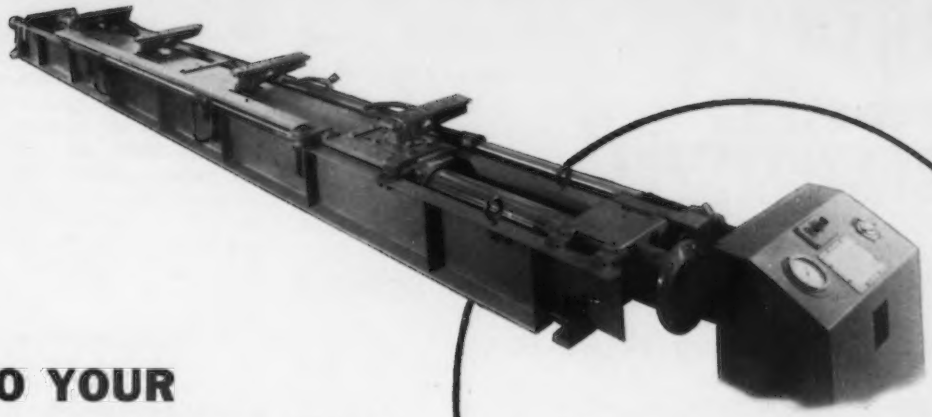
Gerald B. Higgs, Atlanta district sales manager, Wausau Paper Mills Co., Brokaw, Wis., died January 30 in Jackson, Miss.

Mr. Higgs had been associated with Wausau Paper in the Atlanta and Southeastern area since February 1959.

Thomas J. McGuff, 60, died suddenly December 16, 1960, of a heart ailment at the Norwood Hospital, Norwood, Mass. He had been with the Hollingsworth & Vose Co. in East Walpole, Mass., in a variety of capacities for 37 years.

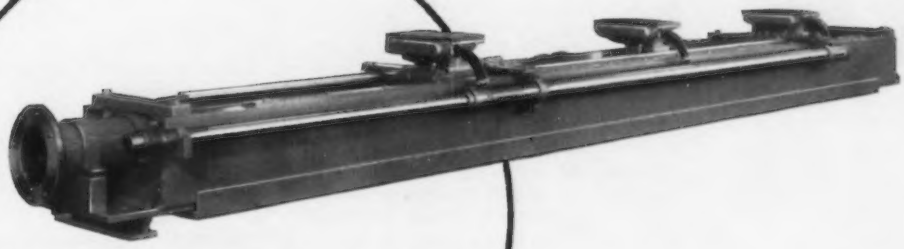
Harry C. Pearson, Michigan manager for Pioneer Paper Stock Co., died January 29 at the Borgess Hospital in Kalamazoo, Mich. He had been associated with Pioneer for 31 years, and was well known to the book mills and paper stock dealers throughout the country.

Andrew J. Waldorf, 89, associated with Waldorf Paper Products Co. for 41 years, died at his home in St. Paul, Minn., January 26 from a heart condition. He was born at St. Cloud, lived in St. Paul 68 years, and at the time of his retirement in 1935 was vice president and production manager of Waldorf.



DO YOUR FELT CONDITIONERS LOOK LIKE THIS?

Modern Vickery *Press Felt* Conditioners like this are employed not only on the big, new, high speed paper and board machines, but to replace old type Conditioners on smaller and lower speed machines. They are equipped with self-contained traveling headers and hydraulic drive with control panel for ready and precise adjustment to speed of felt.



Modern Vickery *Wet Felt* Conditioners are also equipped with traveling headers, hydraulic drives and speed control panels. They operate to reduce cylinder machine shutdowns and slowdowns, overcome crushing, diminish shower volume and lengthen felt life.

If not, you may find it exceedingly profitable to modernize your conditioning equipment.

No matter what the width of your paper machine or the speed of felt travel, there is a Vickery Felt Conditioner of the latest, modern design to meet your present day needs and specific felt cleaning problems.

Ask us to show you what up-to-the-minute Vickery Conditioning can mean in terms of greater production and profit.

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NEWS OF CONVERTERS

West Virginia Makes ImpacTape Equipment Available on Industry-Wide Basis

Manufacturers and users of multiwall bags will now be able to apply in their own bag plants the new, four-ply, double-strength sewn closure ImpacTape as the result of modification equipment developed by West Virginia Pulp and Paper Co.

Mr. Luke said the ImpacTape modification equipment has been specially designed for both H and E heads of Union Special Series 80600 sewing machines. It is being offered to bag users for a small token fee, and to bag manufacturers for a modest annual payment. The company has applied for a patent on the ImpacTape closure produced by the new equipment.

ImpacTape, which has proved effective in sharply reducing bag breakage at its most critical point—the sewing line—was introduced by West Virginia about two months ago. Since that time, interest in the new tape closure has been so great that the company has sped the perfection of modification equipment so as to make it quickly available on an industry-wide basis.

The company is offering ImpacTape modification equipment to paper bag users on payment of an initial fee of only $10. Paper bag manufacturers, regardless of how many millions of bags they make each year, will be able to use the equipment for a modest annual charge of $250.

The modification equipment itself is charged for at cost, which varies according to the type of sewing machine head used. For the H head, the installation charge is $50. For the E head, the charge is $250. These charges cover such items as tape formers, adapter plates, brackets and tape stands. In the case of the E head, it also includes semi-automatic solenoid mechanism which activates tape cut-off knives.

Textile Paper Products Opens Ala. Plant

Textile Paper Products, Inc., has placed its Mobile, Ala., plant in production. The Mobile plant will produce a complete variety of paper cores and tubes for paper mills, concrete construction forms, heating ducts, and textile mills.

E. P. Tinker is manager of the 33,000 square foot plant, located on the Stimrad Road extension.

In addition to its home-office plant in Cedartown, Textile Paper Products operates plants in Carlyle, Ill.; Crossett, Ark.; and Jacksonville, Fla.

Independent Group Buys American Paper Specialty

The American Paper Specialty Co., a leading producer of School Supplies has been purchased from Rapid-American Corp.

Sales of the company for the fiscal year ended January 31 are estimated at $16.5 million, compared with approximately $3 million in 1958. In addition to school supplies and stationery, the company's broadly comprehensive product mix includes binders, briefcases, Christmas greeting cards, valentines, gift wrappings and ribbons.

Riegel Forms New Folding Carton Sales Group

Jack Hutchinson, manager of folding carton sales, Riegel Paper Corp., has announced the formation of a new sales management group to be located at Riegel's headquarters in New York.

Karl Schantz has been named product manager. Dennis Gorski has been appointed to the position of art director. John Weeks becomes sales manager for dairy, egg and jobbing items and Edsel Reed has been appointed sales manager for meat and dry cartons.

Reporting to Mr. Schantz will be the following appointees: Sherman Bloomer, accounting supervisor; Sherman Lynch, planning and estimating supervisor; Robert Longley, product supervisor for dairy and egg jobbers; Robert Chappell, product supervisor for meat and dry cartons; John Marsh, carton designer; and Richard Truini in charge of sales engineers. The position of product engineer for folding cartons is to be filled shortly.

Mr. Hutchinson also announced the appointment of Ted Beales as supervisor of customer services at Riegel's plant in Newark, N. Y. Assisting Mr. Beales will be Almeda Milbrook. Kennis Patterson has been named supervisor of customer services at Riegel's plant in Atlanta, Ga.

Nat'l Blank Book Elects President

Paul B. Buckwalter of Holyoke, executive vice president of the National Blank Book Co., has been named president. The firm manufactures bound and loose leaf business books. Mr. Buckwalter succeeds Richard P. Towne who was named chairman of the board.

Memphis Converting Co. Changes Name

Cleo Corp. is the new name of the Memphis Converting Co. The company is a major national manufacturer of Christmas and everyday gift wraps and related lines.

Change in the corporate title was due to the growth of the company to national scope within four years of its founding, and identification of the company with its Cleo line of gift wrap.

The company's main office is at 596 Jefferson, Memphis, Tenn., and a national sales office is at 200 Fifth Avenue, New York. Other showrooms are in Los Angeles and Seattle.

Condit Becomes President Of Diamond Subsidiary

Gex P. Condit has been named president of Manchester Machine Co., a wholly owned subsidiary of Diamond National Corp.

Before joining Diamond National in 1950 as an industrial engineer, Mr. Condit was with the National Tube Co., a division of U. S. Steel.

At Diamond National Mr. Condit has been assistant to the vice presi-

dent of Diamond's Molded Packaging Div., manager of Custom Contoured Products and, most recently, special assistant to the general manager of the Diamond Match Division.

As president of Manchester, he succeeds Thomas A. Jones who has resigned to take a position as vice president and director of Ethicon, Inc., a wholly owned subsidiary of Johnson & Johnson.

CCA Announces Sales Staff Changes

Promotion of Albert A. Austin from sales manager to general sales manager of the Philadelphia folding carton division, Container Corp. of America, has been announced. In addition, other appointments involving the Philadelphia sales staff were: Joseph P. Giacalone, from assistant sales manager to sales manager of the division; Theodore P. Langdon and George R. Sutch to assistant sales managers.

Sonoco Purchases New Plant Facilities

Sonoco Products Co. recently purchased new plant facilities in Philadelphia, Pa.

The old location had become too limited, according to George Mages, plant manager. "Economy and better handling were cited as the reasons for the move. A greater amount of floor space is available, which will allow more working space and make it possible to install additional equipment," he added. The company will continue to manufacture spiral tubes.

This move is in line with Sonoco's continuous policy to provide the best service and quality to its customers. Sonoco manufactures practically anything made from paper in the form of a cone, tube or a combination of these shapes. Carriers for the textile industry, fibre construction products, cores for paper, sheet plastics, floor coverings, storage tubes and other fibre products comprise a list of the manufactured products.

Specialty Paper and Board Affiliates Meet in New York, Elect Officers

The 27th Annual Meeting of Specialty Paper and Board Affiliates, Inc., was held at the Park Lane Hotel, New York, N. Y., on January 18 and 19.

Officers elected were: President—Samuel R. Sutphin, The Beveridge Paper Co., Indianapolis, Ind.; vice president—James P. Lewis, The J. P. Lewis Co., Beaver Falls, N. Y.; secretary-treasurer—George V. Johnson.

The following are the members who were elected to fill vacancies on the board of directors of the association: Frank C. Ash—Sealright-Oswego Falls Corp., Fulton, N. Y.; J. A. Keenan—Standard Packaging Corp., New York, N. Y.; W. W. Race—Cornell Paperboard Products Co., Chicago, Ill.; C. E. Schaehrer—Riegel Paper Corp., New York N. Y.; Samuel R. Sutphin—The Beveridge Paper Co., Indianapolis, Ind.

At Group Meetings, the following chairmen were elected:

Tag and File Folder—Frank C. Cloyes, International Paper Co., New York, N. Y.

Sanitary Food Board—James S. Benton, The Champion Paper & Fibre Co., Hamilton, Ohio.

Bogus Bristol—James P. Lewis, The J. P. Lewis Co., Beaver Falls, N. Y.

Coated Cardboard—Lawrence B. Kelley, International Paper Co., New York, N. Y.

Mill Blank—Samuel R. Sutphin, The Beveridge Paper Co., Indianapolis, Ind.

At the General Meeting held on January 19, the president and secretary-treasurer gave their annual reports recapping developments in the industry in 1960 and the outlook for 1961 with specific reference to the role of the association. The growth of the association to 62 company members, the highest number ever, was cited as indicative of industry interest in many of Specialty Paper and Board Affiliates' dynamic product groups. Particular reference was called to the formation in 1960 of an Absorbent Paper Group which, under the chairmanship of R. A. Nash of The Sorg Paper Co., will hold its next meeting in New York on March 29, at which time a presentation on the latest developments in synthetic fiber papers will be made by the E. I. duPont deNemours & Co., Inc. Robert E. O'Connor, executive secretary of the American Paper and Pulp Ass'n., discussed some of the aspects of his recent trips abroad in connection with conferences on World Pulp and Paper Development sponsored by the Food and Agriculture Organization of the United Nations.

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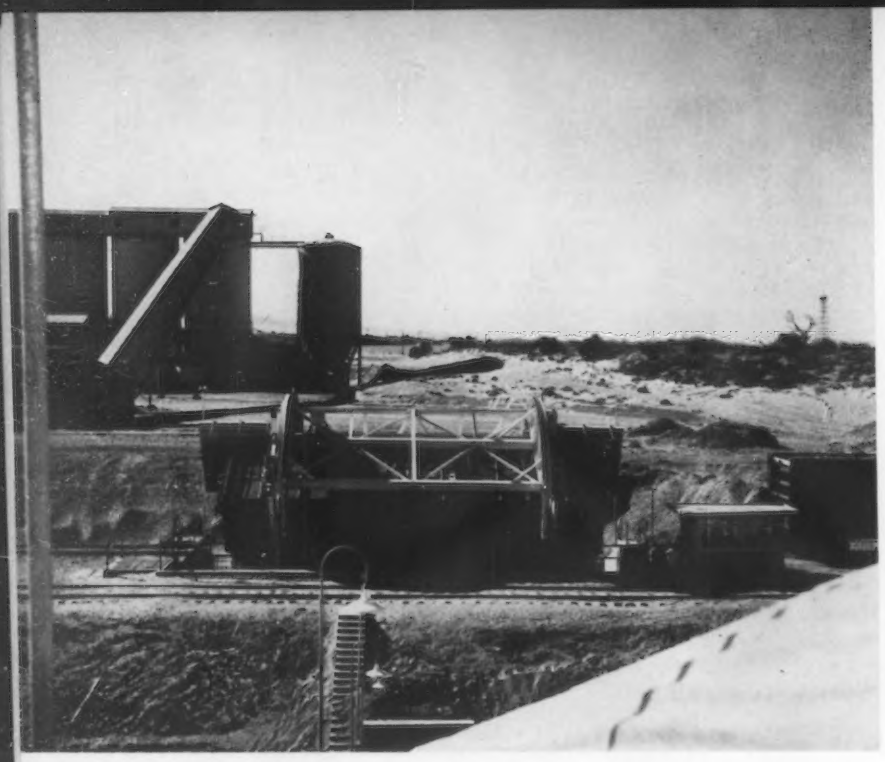


View from black-topped chip storage area shows railroad car being emptied of chips with chip storage silos in background.

Outstanding Features Of Fibreboard's New Kraft Board Mill

- **Chip Handling**
- **Hot Stock Screening**
- **Continuous Digester**
- **172-inch Linerboard Machine**

Paul D. Van Derveer,
Associate Editor,
Paper Trade Journal

A recent expansion program at Fibreboard Paper Products Corp.'s San Joaquin mill near Antioch, Calif., added important new capacity and brought forth several interesting developments for the paper industry.

• One of these is an outstanding chip handling system operated by a crew of only two men and capable of supplying the entire wood requirements of the mill. Chips of different species are stored separately in allotted storage areas in an 800 by 200 foot asphalt-topped storage area. But the eye-catching feature of this system is a car turner which unloads railroad cars of chips in the simplest manner possible—by turning them upside down. It will unload up to ten railroad cars per hour.

• Perhaps of greater significance to the paper industry in general is the mill's use of hot stock screening —a relatively new idea in the manufacture of kraft pulp. Instead of washing then screening, the procedure is reversed. Fibreboard brings pulp from the blow tank through a Fibrilizer, which acts to break up fiber bundles, then to pressurized screens followed by rotary washers. The system has worked without a hitch, pulp quality is high, and mill personnel are well pleased with the operation.

• One of the major components of the expansion program is a 5700 cubic foot Kamyr continuous digester. Another is the 172-inch No. 3 board machine equipped with primary and secondary headboxes and capable of speeds from 250 to 1500 f.p.m. operating on 18 pound to 90 pound natural kraft liner board. Special problems made it necessary to fabricate, assemble and deliver this machine in an extremely short time. Black-Clawson placed the finished components on Fibreboard's doorstep in a phenomenal eight months' time.

The new mill was constructed to initially produce 72,000 tons of kraft liner board per year. However, several elements were built to enable the capacity of the machine to be doubled economically in the future. These include a 415 ton recovery furnace and a 9 by 250 foot lime kiln.

Before the new expansion program was completed, the San Joaquin plant manufactured corrugating medium

for shipping container manufacture as well as bleached kraft paperboard for use in production of food cartons in the company's six western carton plants. The new addition will bring total yearly capacity of the plant to over 200,000 tons.

The third pulp and paperboard mill at San Joaquin was born in 1957 when the executive management instructed the Engineering Department to prepare a plan to provide Fibreboard with facilities to manufacture kraft liner board.

By mid-1958 it was determined that expansion at San Joaquin was the most desirable plan and engineering work was directed toward that end. By May, 1959, the engineering progress culminated in process engineering, estimates, principal layouts and performance requirements. The staffs of the Marketing, Purchasing, Traffic, Insurance, Manufacturing and Accounting departments and many others contributed heavily to the successful development of the over-all plan.

Based on the work that had been completed competitive bids were placed for detailed engineering and construction of the No. 3 machine facilities and a contract was awarded to the Bechtel Corporation.

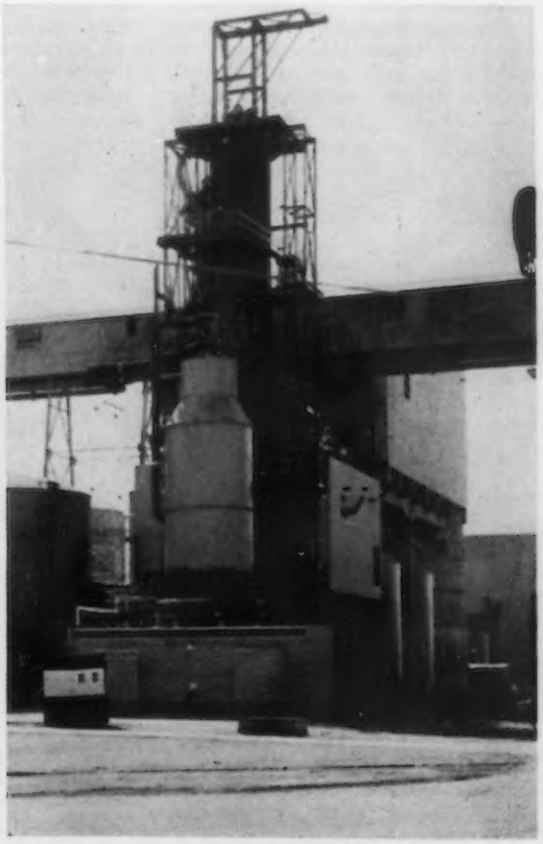
The project was handled by Fibreboard's Engineering Dept. headed by R. J. Hallanger. The engineer in charge of the project was Earl A. Lawver. Working with Mr. Lawver were Frank Bridgeford, C. R. P. Cash, Carl W. Horst, R. L. Henderson, A. F. Tyrill, E. P. de Prosse, and E. A. Collins. R. Hinshaw was the project controller assigned by the Finance Division to the project. Project manager for the Mill was Paul J. Olsen.

Design for Efficient Chip Handling

Wood used at the San Joaquin mill is supplied from sawmills and box factories in northern and central California, and from the company's own forests in the Lake Tahoe Area. A $1,200,000 addition has been made to wood handling facilities at the mill to provide for unloading, outdoor storage by specie, and reclaiming and screening of wood chips. Chips are received in railroad cars and a car turner has been installed to handle up to ten cars per hour. A crew of two men handles the movement of the cars and controls the flow of chips to their allotted storage area within a new 800 feet by 200 feet black topped area beside the car unloading station. The cars loaded with chips are moved to and spotted in the carturner by an operator using a Trackmobile. Motorized rail switches are used to reduce the switching time.

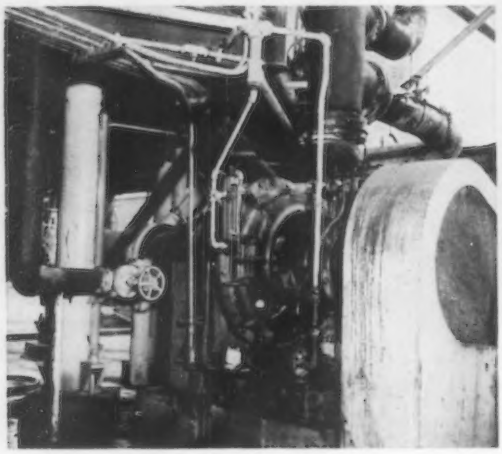
From a central control house located next to the carturner, the other operator starts the carturner. The car slides over to a supporting wall, two clamps descend on the car, lock it in place and in less than 30 seconds the car is turned 180° and is empty. The car is returned to a vertical position and pushed out of the carturner by the incoming car. The chips fall into a steel hopper located under the carturner. Chain drag conveyors unload the hopper onto an inclined 48 inch wide belt conveyor at the rate of 260 units per hour. At about 60 feet above the

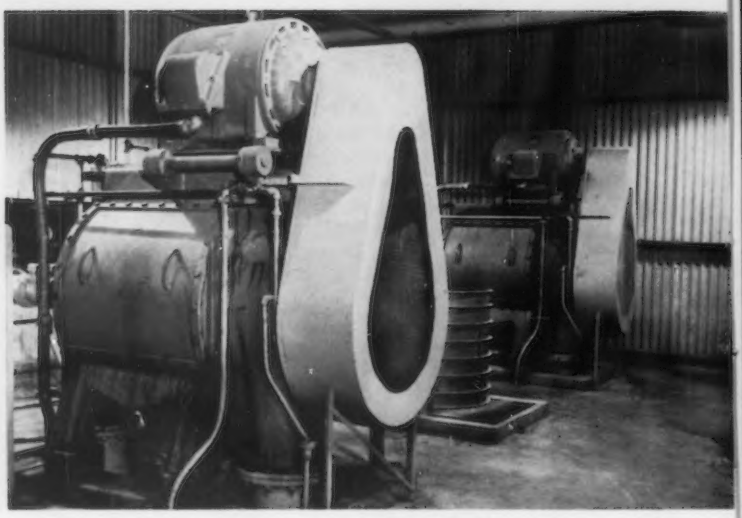
Closeup of car turner. Conveyor moves chips from hopper below car to appropriate storage pile.



Kamyr digester and blow tank. Gallery encloses conveyors carrying chips to the new continuous digester system and existing pulp mill.

Solvo Fibrilizer is externally mounted below the blow tank, is used to break up fiber bundles.





Two pressure screens are part of hot stock screening system. System is said to be highly successful.

black topped storage area this discharges onto an 800 foot long elevated 48 inch wide conveyor running the length of the storage area. This elevated belt conveyor discharges chips through a motor propelled tripper into an area selected by the operator in the control house. There are five major specie segregations, Douglas fir slabwood chips, Douglas fir veneer chips, true fir chips, redwood chips and a pine and fir chip area.

As the tripper is unloading the chips it may discharge at one point or can be made to cycle between two points for better distribution on the pile. Further distribution and leveling of the piles is done with a No. 977 Traxcavator and a No. 275-A Michigan Loader.

There is also a storage area for boxend chips. Boxends, received by trucks and rail, as waste wood from the many box factories in central California are reduced to chips in a hammermill, screened and conveyed pneumatically through a 16 inch diameter pipe.

A pneumatic chip handling system conveys chips either to outside storage, or when needed in process, directly to chip silos. This pneumatic system has a capacity of 50 units per hour with air supplied by a 350 h.p. heavy duty blower delivering 11,400 cubic feet per minute at 6 p.s.i. pressure.

Recovery of wood chips from outside storage is controlled from the screen room. The screen tender controls the rate of flow of the specie selected by varying the speed of the drag chain reclaim conveyors which move chips from the black topped area. The Varidrive driven conveyor will regulate the flow of chips from 30 to 80 units per hour with chips being moved to the drag conveyors by a Michigan Loader when needed. There are five reclaim conveyors discharging onto one 30 inch and one 36 inch wide belt conveyor servicing the full length of the chip storage area.

The wider belt discharges onto an inclined belt conveyor taking chips directly to the screen room. After screening on four flat screens the screened chips are conveyed to one of five 64,000 cubic foot storage silos. The 30 inch belt discharges onto an inclined belt conveyor that takes the chips to blending silos where the chips may be mixed in specified ratios prior to screening. Chips from the woodmill such as Eucalyptus and boxend chips, and chips from the blending silos are screened on two new No. 72 Rotex screens.

Sawdust and fines from the old and the new screen room operation are conveyed in two separate pneumatic systems to a silo, mixed with bark from the woodroom operation and burned in a boiler which adds approximately 40,000 pounds of 150 p.s.i.g. steam per hour to the mills steam system. Oversize chips from the screen operation are discharged into hammermill type rechippers and returned for rescreening.

Continuous Digester Supplies Pulp for New Machine

Chips for the new mill, Douglas fir, true fir and pine in controlled ratios are withdrawn from the chip silos through plate feeders onto a belt conveyor that feeds the kraft digester system. To protect the digester from tramp iron a magnetic head pulley and a selenium rectifier controlled magnet have been installed. The chips feed from the conveyor into a storage hopper about the digester. This has about an hour's storage capacity. From the hopper chips are fed by gravity into a chip meter, through a low pressure feeder and then into the steaming vessel. These units operate in series and perform the function of metering the chips to the digester at a controlled but variable rate and act as a steam lock to the steaming vessel. The chips are preheated for 3 to 5 minutes in the steaming vessel then fall through the chip chute cooler aided by a flow of black liquor into the high pressure

feeder. High pressure black liquor flushes the chips through the feeder into the top of the main vessel of the 100 foot tall 5700 cubic foot Kamyr digester.

Under carefully controlled pressure, temperature and liquor volume conditions, the chips move downward in the digester. The final cooking temperature is reached by withdrawing liquor from the shell through screens set in the wall and passing the liquor through forced circulation external heaters and hence back to the digester body. At the bottom of the digester both the temperature and the density of the pulp is lowered by introducing cold black liquor from the first stage washer liquor tank.

A rotating scraping mechanism keeps the chips free to move towards a disc strainer located external to the digester. In this unit the liquor is separated from the pulp and returned to the bottom of the digester continuously to keep the pulp moving from the bottom of the digester through the disc strainer unit. From here the pulp is blown through either one of two blow valves into the blow tank.

There are three vertically mounted black liquor heaters of the shell and tube type fabricated of ASTM A-285 steel with internals and tubes of type 304 stainless steel. Other heat exchangers used in connection with the Kamyr digester are of the Rosenblad spiral type. Digester operation is controlled from a graphic central panel complete with instruments to record and indicate every phase of the operation. The blow tank operates at 15 p.s.i.g. pressure and is vented back to the steaming vessel. It is of conventional design with a 10 ton surge capacity.

Hot Stock Screening Immediate Success

A feature of the new mill is hot stock screening to secure improved washing while effecting a considerable saving in capital investment. According to mill personnel this system started without a hitch and has already proven satisfactory in operation. Fibreboard's system is such that stock from the blow tank passes through a Solvo Fibrilizer then to pressure screens and the washers. The Fibrilizer provides a rough refining operation to separate the fiber bundles and is mounted external to the blow tank. The 250 h.p. unit, furnished with isolating valves, is essentially a pump with its impeller fastened to a perforated screen plate. Partially disintegrated stock which has been broken down by the impeller and the action of screen plate scrapers passes through the plate under sufficient pressure to discharge directly to two Impco pressure screens located at a higher elevation.

Magnetic flowmeters regulate the flow of stock to the screens so that 60 per cent of the raw stock goes to No. 1 screen. The rejects from No. 1 are pumped together with the remaining 40 per cent raw stock to the No. 2 screen. Rejects from screen No. 2 are pumped to an Impco Vibrooke screen. The acceptable fiber from this screen is pumped back to the blow tank. Acceptable screened stock from No. 1 and No. 2 screens flows to Swenson washers. These are of conventional design consisting of four 9 foot diameter by 16 foot single stage drum washers. The last stage washer discharges stock directly into a concrete tile lined high density chest which also provides the support for the washer and screen building. These are of reinforced concrete construction. The washer filtrate flows are handled conventionally.

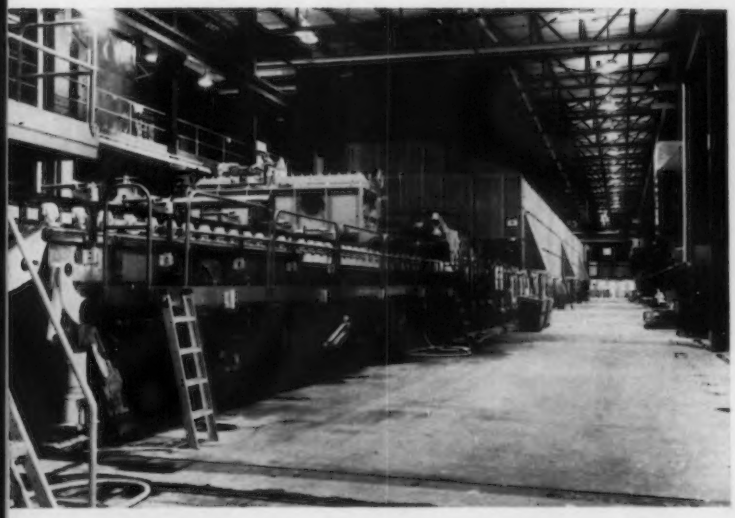
Filtrate from the first washing stage is pumped to the screens and for use as dilution and wash, to the digester compression liquor pumps, and the chip chute level tank, to the blow tank black liquor quench cooler and to the digester cold blow pump. Surplus black liquor from these recirculating flows goes from the first stage filtrate tank into a foam tank from where it is pumped to the weak black liquor storage tank.

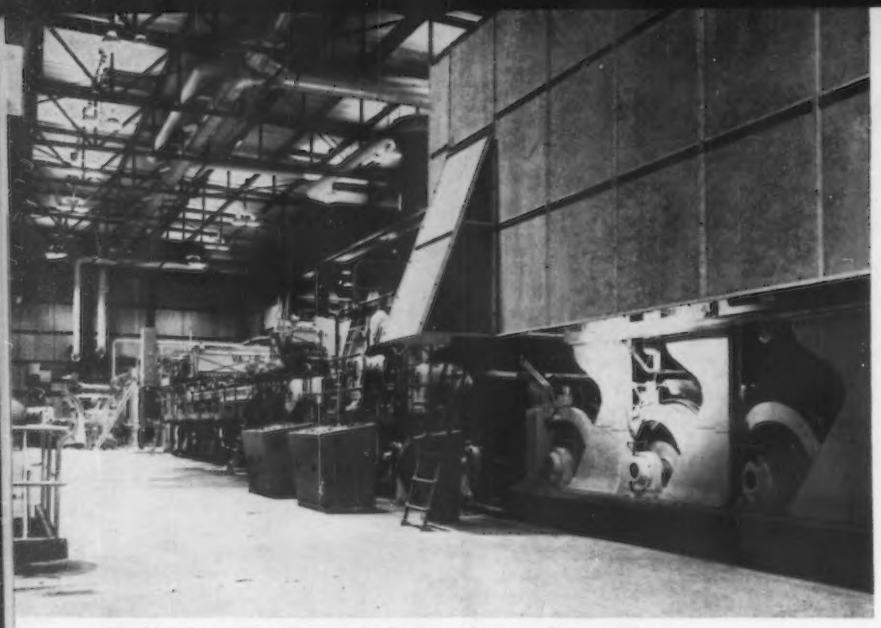
Stock Preparation

Stock from the 100 ton capacity high density chest is pumped to the low density chest in the boardmill 300 feet away. Agitator and mining nozzles are located in the high den-

Jordan piping arrangement provides flexibility in selection of h.p. day per ton of product.

Complete linerboard machine was supplied by Black Clawson in only eight months time. It has primary and secondary headboxes, is designed to make 18 to 90 lb. board.





Machine has 172 inch wire, is designed for speeds from 250 to 1,500 f.p.m. Design of dryer frames permits easy access.

sity chest and white water from the boardmill provides the dilution water to bring the consistency down from 12 per cent to a pumpable 5 per cent. The consistency regulators used here and throughout the new mill are pipeline consistency regulators.

From the low density chest the stock is pumped through two 42 inch Double-D disk refiners, each driven by an 800 h.p., 514 r.p.m. motor and are piped to operate in series or parallel. The refiners discharge into the primary and secondary machine chests. Agitation for these chests and the low density chest is provided by horizontally mounted agitators.

Stock for the primary headbox of the new No. 3 machine is pumped to one of three Jones Majestic jordans, each driven by a 400 h.p., 400 r.p.m. motor.

The piping arrangement for these units provides great flexibility in the selection of a horsepower day per ton of product both for stock to the primary as well as the secondary headbox.

Initial Operation of No. 3 Exceeds Expectations

A 490 foot long building houses the machine and is constructed of steel with cement asbestos panel walls. It is located 300 feet west of the pulp mill to facilitate future expansion of the old mill.

The Black-Clawson paperboard machine has a 172 inch wide by 133 foot long fourdrinier section and is of the permanent cantilever quick wire changing type. The primary and secondary airloaded headboxes are by Valley Iron Works, designed to operate in a speed range of from 250 to 1500 feet per minute, and to operate on 18 pound to 90 pound natural kraft liner board. There are nine suction boxes, a 28 inch diameter breast roll, and a 40 inch diameter suction couch roll. Already the new No. 3 machine has reached an operating speed of 900 f.p.m. and has produced up to 260 tons per day of on-spec board.

The main press section consists of straight through suction first and second air bleed presses. The bottom suction rolls are 30 inches diameter by 172 inch drilled face with bronze shells without rubber cover. The pneumatic loaded top press rolls are 28 inches in diameter complete with 1 inch thick self-skinning covers. Vickery press felt conditioners are utilized, each with three jordan shoes. Space has been provided for the future addition of a smoothing press which would be short coupled to the beginning of the dryer section. Space has also been provided for addition of a breaker stack between the first and second dryer section.

There is a total of 54 paper dryers, 60 inch diameter by 170 inch face, and four felt dryers, all designed for 125 p.s.i.g. steam pressure and having Johnson self-compensating steam joints. The heavy duty anti-friction dryer bearings are lubricated by a pressure-gravity type circulating oiling system. A horizontal type size press is located between the second and third dryer section and has rubber-covered rolls 28 inches in diameter by 170 inches face.

There are three dryer sections followed by two open calender stacks with two 60 inch diameter dryers mounted between the stacks. The first stack has eight rolls, the second stack six rolls. Both bottom rolls are 30 inches diameter, the intermediate rolls 16 inches diameter and the top roll 22 inches in diameter. Oscillating doctors are provided for the bottom rolls while stationary doctors are installed for the remaining rolls. Two combination water box and Lodding doctors are furnished for the wet stack. Calender rolls and calender dryer bearings are lubricated from the main oiling system. An Auto-Flyte super 36 inch reel follows the last calender stack.

Winder Operation

Reels of board go to an unwind stand complete with an air operated, self-compensating brake. A Model 180 Verti-Shear two drum winder has been installed, and this is designed for a maximum trim of 160 inches and a maximum rewind capacity of 72 inch diameter rolls. The winder has a top speed of 4500 f.p.m. and includes a gear operated roll ejector mechanism which ejects the finished rewound rolls onto a hydraulically operated roll unloading table. A standard swing type, power operated shaft puller has been installed to pull the 4 inch diameter Tidland leaf type shafts from the rewound rolls.

The rewind drums are V-belted together and driven by a 250 h.p. d.c. motor. The V-belts are contained in a separate drive stand outboard of the winder frame and will provide for the adjustment of the over-speed of the front drum to help wind tight rolls.

From the roll lowering table the rewound rolls are positioned on a belt conveyor in the floor, strapped automatically in a bander, weighed and moved into a Lowerator which takes the finished rolls to the basement and the loading dock.

Line Shaft Drive

The paper machine is driven by a variable speed line shaft mounted on

the machine room floor driving through Extremultus laminated flat belt drives to individual back drive stands on the various sections of the machine. Each drive is equipped with an air operated cut-off type clutch and also an electrically operated felt shifter operated from the front side of the machine.

The line shaft drive is a 1600 h.p. non-condensing steam turbine with reduction gear delivering 800 r.p.m. at the double end output shaft. The turbine is operated with 150 p.s.i.g. back pressure providing steam for the dryer steam and condensate system.

Air System

The paper machine air system consists of a dryer hood and a calender hood both fabricated from flat cement asbestos board manufactured by Fibreboard. The vapor absorption system utilizes both fresh air from the outside and hot air from the hood. A Hi-Jet system supplies air to 26 pockets of the machine using aluminum piping to convey the air. Filtered outside air is provided for cooling of king rolls and second rolls in the calender stacks.

Broke System

Below the new board machine a 40 foot belt conveyor extends back from a Slushmaker broke pulper to the last dryer section. It is designed to handle full machine speed broke into the pulper. The pulper, a 34 inch Model CB is mounted in a tile chest as wide as the machine. Three sides of the pulper have been extended with fabricated steel up to the machine floor. This provides a chute guiding the broke from the calenders, reel and other sources into the pulper. Trim from the winder operation is conveyed pneumatically to the pulper. From the pulper, stock is pumped to the 20 ton broke chest or directly to the primary machine chest.

All vacuum pumps for the machine with the exception of the felt conditioner vacuum pump, have double shaft extensions connected together and are driven by one 600 h.p. Westinghouse motor.

A Dorr-Oliver eight foot diameter by ten foot rubber covered, stainless steel fitted drum saveall has been installed. It is expected to produce an effluent containing 0.25 pounds solids per 1000 gallons or less.

Additives

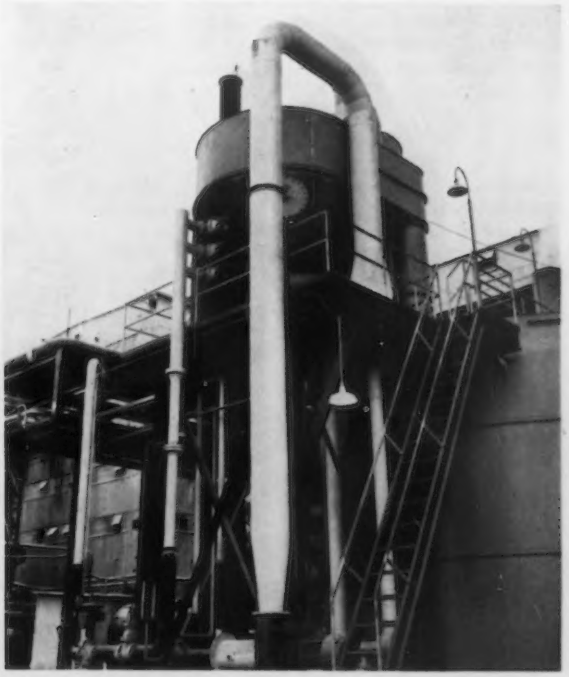
Another feature of the expansion program was installation of a Corn Products Co. bulk starch handling system. In this system the main storage silo is located outside the machine building. Raw starch from air-slide rail cars is unloaded into the silo pneumatically and is discharged by means of twin screw conveyors into a 25 pound automatic batch scale which in turn discharges by gravity into a slurry tank.

Slurry is pumped continuously from the slurry mixing tank into an enzyme converting system at a feed consistency of 20 per cent. Temperatures in the cook, kill and ready tanks are maintained by temperature recorder-controllers operating steam control valves feeding spargers in the respective tanks. A viscometer is installed in the cook tank to continuously record the viscosity of the starch as it leaves this tank. The starch ready tank is equipped with an agitator and a temperature indicator-controller to insure uniform starch conditions to the size press.

In the same outdoor area as the bulk starch facilities are found tank car and truck unloading and storage facilities for the other standard paper making additives. Two 8000 gallon capacity tanks are installed for alum and for wet strength resin. A 16,000 gallon tank receives rosin paste from tank cars. A rosin emulsifier by Hercules discharges into a 6000 gallon dilute size storage tank from where it is distributed as required to the primary or secondary machine chest.

Other components of the additives system are a Locust bean gum system which is located indoors in the basement of the machine building and a 6000 gallon capacity sulphuric acid tank which supplies acid for control of the pH of stock to the board machine.

Trobeck type oxidation tower is expected to reduce sulphur losses and kraft mill odor by oxidation of black liquor.



Vacuum system for the machine utilizes Roots-Connersville pumps, all driven by single 600 h.p. motor.

Recovery System

Black liquor from the brown stock washers is stored in the weak black liquor storage tank, from where it is pumped to Trobeck type oxidation tower. This tower is a part of Fibreboard's continuing efforts in the control of the kraft mill odor. It is expected that the oxidation of the black liquor in the Trobeck unit will greatly reduce the concentration of volatile oxidizable sulphurous compounds and hence reduce the sulphur losses in the black liquor evaporator.

The black liquor evaporator is a natural circulation sextuple effect unit designed to process 185,600 pounds per hour using 25,700 pounds per hour of 50 p.s.i.g. steam. The unit is furnished with wire mesh entrainment separators.

The mill's new recovery furnace has a capacity of burning 1,245,000 pounds of black liquor solids per day and produces at full load 197,000 pounds of 600 p.s.i.g., 715° steam per hour. Since full load steam capacity is required to operate the new mill, fuel oil is burned to supplement the black liquor.

An electrostatic precipitator has been installed and this is a wet bottom unit with a separation efficiency of 99.6 per cent. It is a double chamber, 44 lane, 4 field, separately energized unit powered by three 700 m.a. double half wave silicon power units and is constructed of acid proof brick.

To reduce further any contaminants to less than 0.01 grains per cubic foot from the electrostatic precipitator, two stack scrubbers are installed. These Pease-Anthony type scrubbers, each with a capacity of 78,500 cubic feet of 280°F. flue gases, are constructed of 316 ELC stainless steel and are 12 feet in diameter and 42 feet tall. Recirculated water flow for these scrubbers is approximately 200 gallons per minute.

E. L. Wiberg, superintendent liner board, seated, and P. J. Olsen, project engineer.

Causticizing

The causticizing and lime reburning section of the new mill is quite conventional and follows the usual Dorr-Oliver lime recovery flow sheet. The causticizing plant is sized for 72,000 tons per year capacity while the Traylor 9 foot diameter by 250 feet long lime kiln is adequate for doubling capacity in the future. Lime mud at 65 per cent solids is fed to the kiln from a Bird centrifugal lime mud filter. To reduce discharge of solids from the lime kiln stack a venturi scrubber and cyclonic separator have been provided.

Water Supply

Water for the new mill is available from the San Joaquin River adjacent to the plant or from a canal system. A new 30 inch diameter, three mile long pipeline supplies water from the canal to a 57 foot diameter Eimco-Process Reactor clarifier. This is a 3000 gallon per minute, upflow solids contact type unit.

The water to be used in process is filtered in three 8 foot diameter by 25 foot long pressure filters. Further purification of the process water takes place in an Infilco designed demineralization plant. Three Catexer and three Anexer units are designed for operation at a maximum rate of 1060 gallons per minute with two lines in service and one out for regeneration. Sulphuric acid and 50 per cent caustic is used for the regeneration process. Instrumentation provides for a fully automatic water treatment plant. To provide approximately 60 gallons per minute of boiler makeup water, two secondary Anexer exchangers have been installed. Aluminum piping is used throughout the mill for distribution of the demineralized water.

Personnel

Key personnel at Fibreboard's San Joaquin mill are: C. M. Stitt, plant manager; E. J. Cavanaugh, general superintendent; C. C. Serrahn, service superintendent;

J. C. Rollins, superintendent, woodmill and yard; H. S. Smith, superintendent, pulp mill; E. G. Barradas, superintendent, board mill; E. L. Wiberg, superintendent, liner board; R. O. Myers, plant engineer;

P. J. Olsen, project engineer; J. Challas, technical superintendent; L. F. Muir, traffic coordinator; G. B. McCuish, personnel manager; C. O. Dean, office manager.

PRINCIPAL SUPPLIERS

Agitators	Mixing Equipment Co.	Liquor oxidation system	A. H. Lundberg
Bulk starch system	Corn Products Co.	Motors—electric	Louis Allis, Reliance, U. S. Electric, Westinghouse, General Electric, Master Gearmotor, Century
Centrifugal filter-lime mud	Bird Machine		
Car dumper-chips	Heyl & Patterson		
Causticizing equipment	Dorr-Oliver		
Conveyors	Link Belt	Pressure filters	Infilco
Clarifier	Eimco	Pumps—fan	Warren Pumps
Consistency control	Fischer & Porter	Pumps—vacuum	Roots-Connersville
Conveyors—pneumatic	Rader Pneumatics	Pumps—general	Goulds, Worthington, Bingham, DeLaval, Ingersoll Rand
Conveyor—roll strapping, roll lowerator	Matthews Conveyor		
Condensate system	Mason-Neilan	Precipitator—electrostatic	Koppers Co.
Cranes	Crane Hoist Engineering	Recovery boiler, cyclone evaporator	Babcock and Wilcox
Digester—continuous system	Kamyr, Inc.		
Deaerator	Graver	Refiners, jordans, agitators	E. D. Jones
Evaporators—sextuple effect	Chicago Bridge & Iron	Screens—chip	Orville Simpson
Fourdrinier machine	Black-Clawson	Screens and Fibrilizer	Improved Machinery
Headboxes—primary and secondary	Valley Iron Works	Scale—chip	Fairbanks Morse
		Scale—board rolls	Toledo Scale
Instrumentation	Foxboro, Bailey Meter, Leeds & Northrup	Switchgear—electrical	Allis Chalmers
		Turbine—lineshaft drive	Westinghouse
Kiln and drive	Traylor Engineering	Vent scrubber—smelt tank	Buell Engineering Co.
Liquor heaters	ESCO	Washers	Swenson Co.

Fine Particle Pigments in Paper—I

Evaluation of Optical Properties

A new method for evaluating pigments in paper has been developed which eliminates problems present in the past.

M. P. Boland and B. J. DeWitt
Chemical Division,
Pittsburgh Plate Glass Co.

In the past, it has been the practice to evaluate the optical properties of paper pigments by incorporating them in paper and measuring such properties as opacity and brightness. However, interpretation of such results is generally obscured by minor variations in sheet weight, pigment retention, and the interdependence of brightness and opacity. To remedy this and obtain a useful single-scale evaluation of the optical effects of pigment in paper, a carefully standardized papermaking procedure has been developed to provide data suitable for interpretation by the Kubelka-Munk theory.

Kubelka-Munk Theory

The Kubelka-Munk theory of light scattering was first published in 1931. Applications of this theory were later made to paper and to paint films by Steele, Judd, Davis, Kubelka, and Adrian. Basically, the application to pigmented paper involves an approximation which Judd shows to be valid up to about 10 per cent pigment.

Two constants are used, one for the light absorption characteristic, K, and one for the light scattering ability, S. Both of these are represented as specific constants expressing the light scattering or light absorbing power unit thickness (or per unit basis weight for paper). The work described here is concerned with the scattering coefficients although the absorption coefficients can be determined readily by a simple extension of the calculations.

The specific scattering coefficient, S, is defined as follows:

$$S = \left(\frac{d\,Ro}{dX}\right)_{X \to 0}$$

where Ro = black backed reflectance
X = thickness of layer

The units of S will be the reciprocal of those for X. Actually, S may be viewed as the limiting value for the black backed reflectance as the thickness (or basis weight) approaches zero. One may conceive of it as the reflectance of a very thin film (without any reflection back through the sheet from the backing) expressed per unit thickness (or basis weight).

An improved evaluation of pigment performance can be obtained by calculating the specific scattering coefficient for the pigment and thereby allowing for the variations in retention, sheet weight and paper brightness, all of which have a direct and important bearing on the opacity of the sheet. We may define some of the quantities involved as follows:

SX = scattering power of the sheet of paper (reflectance units)
X = sheet weight (basis weight, lb./TAPPI ream)
S = specific scattering coefficient of the sheet tested (reflectance per lb. per TAPPI ream)
S_{paper} = Specific scattering coefficient for the pigmented paper
S_{pulp} = Specific scattering coefficient for the unpigmented pulp sheets
$S_{pigment}$ = Specific scattering coefficient for the pigment *in* the sheet
a = The fraction of pigment in the paper

Calculations

The calculations are carried out as follows:

1. R_0 = black backed reflectance (Hunter).
2. $R_{0.89}$ = white backed reflectance (89% reflectance backing) (Hunter).
3. Using R_0 and quotient $R_0/R_{0.89}$, read SX from the Judd diagram.
4. Taxing X on a weight basis in lbs./TAPPI ream we divide "SX" by the sheet weight in lb./TAPPI ream to get S_{paper}, the specific scattering coefficient for the paper.
5. Steps 1-4 are repeated for the unpigmented "control" sheets and the results designated S_{pulp} to distinguish from the pigmented sheets.
6. The pigment content of the sheets used in the optical tests is determined from the ash content of the composite, as follows:

where a = per cent pigment in the paper
b = per cent ash in the paper
c = per cent ash in the pulp (control sheets)
d = per cent loss on ignition of pigment,

$$\text{then: } a = \frac{b - c}{100 - d}$$

7. S for the pigment is then calculated according to the following formula:

$$S_{paper} = (1 - a)\,S_{pulp} + a\,S_{pigment} \quad (1)$$

or

$$S_{pigment} = \frac{S_{paper} - (1 - a)\,S_{pulp}}{a} \quad (2)$$

This approach uses the effect of the pigment on the sheet, and therefore, gives an $S_{pigment}$ for the pigment as it exists in the sheet; it also includes the effect which the pigment has upon the sheet. One might represent the value obtained, S_{pig}, as the sum of the specific scattering power of the pigment per se (as it is distributed in the particular sheet) and the additional scattering power

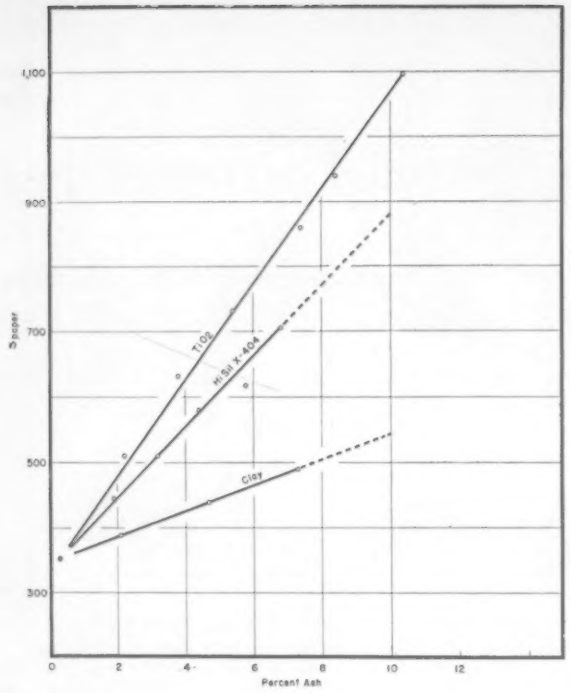


FIGURE 1: LOADING STUDY CURVES

developed in the pulp by the presence of the pigment (e.g. the pigmentation of the fibrillar structure which would otherwise reunite optically with the fibers and pigmentation of the interfiber bond areas). Thus, the $S_{pigment}$ value derived is not an absolute one and does vary from one pulp to another. However, it does provide us with an excellent means of pigment evaluation.

Experimental

The experimental methods used are described below:

A. PULP PREPARATION

A commercial bleached kraft pulp is beaten in a five pound Noble & Wood beater to 400 cc. Canadian Standard freeness plus or minus 10 cc. using deionized water. This beater load of three per cent pulp is then divided into 4667 g. portions ± 5 g. which are dewatered to about 10 per cent solids (ca. 1400 g. containing 140 g. dry). These pulp pads are then stored in a refrigerator until used. When a pigment is to be tested, distilled water is added to one of the pads of pulp bringing the total weight to seven kg. thus producing a two per cent pulp slurry.

B. PIGMENT ADDITION

The pigment sample is weighed out (14 g. ± 0.1 g. for a ten per cent loading); slurried in 300 to 400 cc. water in a small laboratory mixer (Waring Blendor); mixed with the two per cent pulp in a plastic bucket using an electric propeller type mixer; and allowed to stand for at least 30 minutes. The pH is adjusted with alum (normally to 5.0) and any other additives required for the particular experiment are added and noted. The alum used at this point plus that needed to maintain the white water at pH 5 is taken as the alum demand of the pigment.

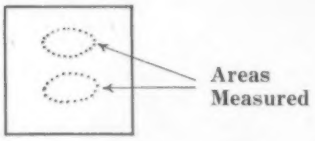
C. SHEETMAKING

Sheetmaking is carried out on the Noble & Wood machine, using white water recirculation. Prior to the run, 40 liters of distilled water is placed in the water reservoir and adjusted to pH 5 with alum. The required amount of stock is added to the proportioner and water is pumped from the reservoir to fill the proportioner. After thorough mixing, a weight sheet is prepared and the stock in the proportioner is carefully adjusted so that sheets of standard weight will be obtained. The standard weight is 2.62 g. ± 0.16 g. (8″ x 8″ sheet). Sheets are then formed on the Noble & Wood machine drawing stock from the proportioner and using the one quart measuring container. This permits 17 sheets to be made from each proportioner. Two such proportioners of pigmented sheets are formed in order to build up the white waters with fiber fines and pigment. Toward the end of the second proportioner a state of equilibrium is established according to our studies of the ash content of the sheets.

D. PAPER TESTING

Normally the last nine sheets of the second proportioner are tested after conditioning overnight at 73° F. and 50% R.H. The first four of these are used for physical tests and the last five are used for optical tests. The five sheets employed for optical tests are subsequently used for ash determinations.

The optical tests are made on the Hunter All-Purpose Reflectometer taking readings in two positions on each sheet as indicated below:



Three separate reflectance measurements are made on each of these areas—one white backed, 0.89 reflectance; one black backed; and one consisting of the pad of all five sheets. These give in order $R_{0.89}$, R_0 and the brightness. The first two measurements are taken with the green filter which simulates white light for this purpose while the brightness reading is taken with the blue filter. A fresh pad of filter paper works quite well as the 0.89 white backing. It gives a reflectance of about 0.915 when referred to standard taking MgO as 1.00. Taking MgO as 0.97 this equals 0.89.

Once the optical tests have been completed the five sheets are weighed on an analytical balance. Also composite samples of the five sheets are prepared and weighed in the conditioned atmosphere. These samples are used for the ash determination, which is made in the usual fashion, burning the samples off over a flame and then finishing in a 1000° C. muffle for one hour.

Results and Discussion

Typical results with this procedure are shown in Table I. The reproducibility of the test is generally quite good. The 2σ limits for the S_{pig} determination is ± 0.02 for loadings in the seven to ten per cent range, i.e. 95 per cent of the values fall within these limits. As can be readily seen from equation (2), if the loading is too light, "a" is small, and small errors in "a" will be quite serious. For this reason, and the fact that reproducibility has not been good at low loadings, the determination of the S_{pig} from

TABLE I. TYPICAL LABORATORY TEST RESULTS

Pigment Description	Ash %	Opac., %	Brtn's. %	S_{pig}	$S_{paper} \times 10^4$
Clay	7.4	76.5	78.1	.20	490
Diatomaceous Earth	7.3	80.0	79.9	.34	573
Hi-Sil X404	7.2	84.1	85.7	.52	731
TiO_2 (Anatase)	8.4	87.8	84.4	.76	941

TABLE II. DATA ON LOADING STUDY

Pigment Added, %	Ash, %	Opacity, %	Brightness, %	$S_{paper} \times 10^4$
Hi-Sil X404				
10	6.8	83.5	81.7	705
8	5.8	83.4	81.6	635
6	4.4	81.1	81.2	580
4	3.2	80.3	79.6	520
2	1.9	74.4	77.3	443
0	0.3	69.6	75.6	352
TiO_2				
13	10.4	90.3	86.0	1096
10	8.4	88.1	84.4	941
8	7.4	86.8	83.1	861
6	5.4	84.3	81.7	732
4	3.8	80.6	80.5	632
2	2.2	77.5	78.5	509
Clay				
10	7.3	76.0	75.4	491
6	4.7	74.2	74.2	439
2	2.1	71.0	74.3	388

papers containing less than five to six per cent pigment is not recommended.

An alternative treatment of the data useful in extended studies, such as those shown in Table II, is shown in Figure 1. Here the S_{paper} is plotted against ash content of the paper for the series of tests shown in Table II. The S_{paper} value, of course, is a measure of the light scattering ability of the paper itself and as such gives a good summation of the performance of a given furnish. Variations in brightness and sheet weight are taken into account by it. Moreover, the S_{paper} value is obtained very simply by using only the sheet weight, the optical measurement, and the Judd diagram.

Curves such as those in Figure 1 permit an accurate single value estimate of the optical performance of pigment in a given fiber furnish, since it makes allowance for the brightness and weight variations. Of course, it requires that a series of runs be made at various loadings.

By plotting several of these curves on the same graph an accurate estimation of the relative performance of different pigments in a given pulp furnish can be made readily. The lines parallel to the abscissa are equal performance lines intersecting the curves at ash value required for that performance level. Lines parallel to the ordinate will show the performance at a given ash content.

The above type of plot can be refined somewhat; pigment in the sheet, or loadings can be substituted for the ash while improvement in the S_{paper} due to pigmentation (numerator of equation (2)) can be substituted for S_{paper}.

In conclusion the methods described above have been used for several years and have proven much more useful than previous methods of pigment evaluation, in research, in service work, and in product control. Moreover, the laboratory predictions of equivalent pigment furnishes have checked well in the field.

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Causes and Cures of Chain Drive and Sprocket Ailments

A. H. Sobczak,
Supervisor, Engineering Services,
Chain Belt Co.

Relative Position of Sprockets

The relative position of sprockets in drives should receive careful consideration in order to get maximum efficiency from the drive. The various arrangements illustrated in Figures 1-4 are considered the best possible to assure the most efficient service. In each figure, direction of rotation is indicated by the arrows. Note that the direction of rotation of the drive sprockets in each case can be reversed.

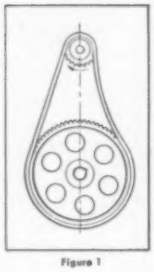


Figure 1

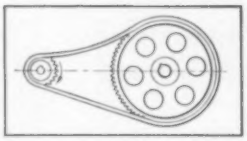


Figure 2

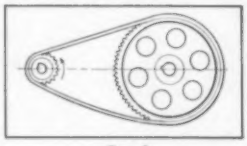


Figure 3

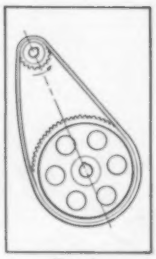


Figure 4

If none of the preceding arrangements can be followed due to design limitations, an attempt should be made to use an arrangement as illustrated in Figures 5, 7 and 9. . . .

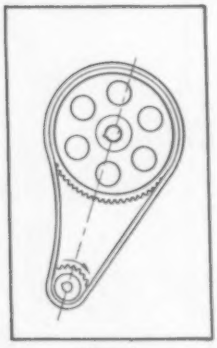


Figure 5

With the drive slightly inclined, Figure 5, the weight of the slack chain helps to maintain better contact between the chain and sprockets.

When the large sprocket is directly above the small sprocket, Figure 6, a drive cannot operate with much chain slack. Slack, due to wear, must be taken up by adjusting center distances or by using an idler . . . a mechanical device for taking up chain slack.

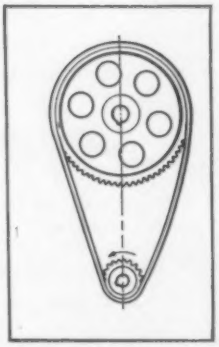


Figure 6

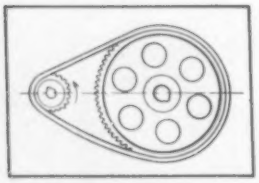


Figure 7

Where center distances are short or drives nearly horizontal, slack should be in the bottom, Figure 7, rather than as in Figure 8. An accumulation of slack in the top strand may allow the chain to be pinched, and increases chain joint flexure unnecessarily.

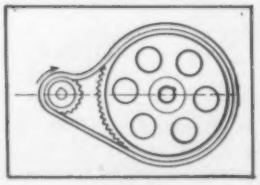


Figure 8

Figure 9

When small sprockets are used on horizontal drives, slack should be on the bottom, rather than on top. Otherwise, the strands may strike each other.

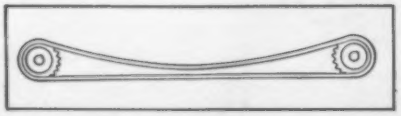
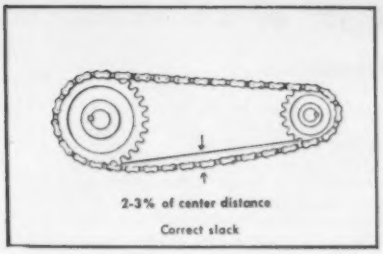
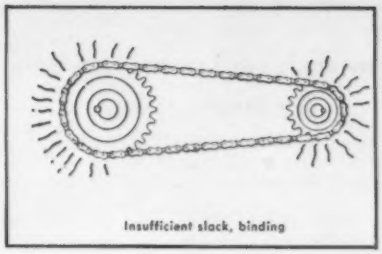
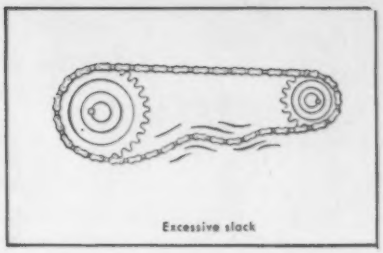


Figure 10







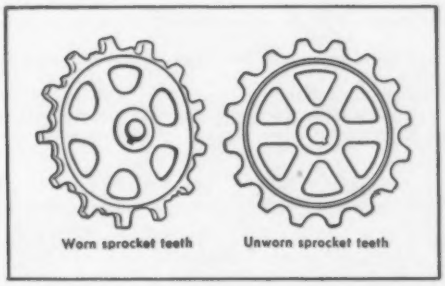
Proper Chain Slack

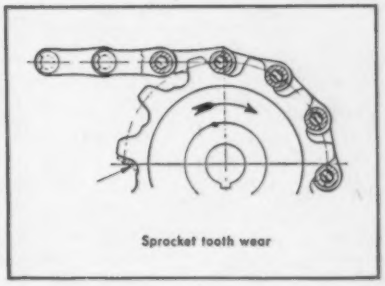
The correct amount of slack is essential to the proper operation of chain. Unlike belts, chain requires no initial tension and should *not* be tightened around the sprockets. Properly adjusted chain drives should permit slight flexure by hand in the slack strand of about 2 and 3 per cent of the sprocket centers.

When the chain is too tight, the working parts carry a much heavier load than is necessary and work much harder without delivering any more power than properly installed chain. This causes rapid chain wear because of increased pressures in the joints. In addition, this condition overloads and accelerates wear in the shaft bearings as well.

Excessive slack is also harmful. On long centers particularly, too much slack will cause vibration and chain flexure, materially reducing the life of the chain. On long centers, it is recommended that the slack strand be supported or taken up by idler sprockets or strip guides of hardwood or brass. The strip is simply a continuous support for the chain which prevents it from sagging.

Danger of Worn Sprockets





Chains cannot be efficient or durable if used with worn or faulty sprockets. It is, therefore, important to inspect sprockets regularly for wear and alignment.

1. First of all, chains and sprockets *must* mate, with each having exactly the same pitch.

2. Be sure shafts are set parallel and level in rigidly supported bearings.

3. Sprockets must be mounted squarely and securely on their shafts.

4. Never run new chain over sprockets with worn or "hooked" teeth. This practice reduces chain life very rapidly by increasing internal chain loads. Excessive wear and even breakage results.

5. Never run badly worn chain on new sprockets. In this case the sprocket pitch is shorter than the chain pitch, and correspondingly just as worn sprockets hurt good chains, worn chain will cause premature wear and reduce wear life of new sprockets.

6. If not too badly worn, sprockets can be reversed on the shaft, using the unworn tooth surfaces. This is practical, since sprocket teeth are symmetrically designed. However, we recommend caution in reversing sprockets on high-speed drives. Do not reverse when the back sides of teeth show any signs of wear.

NOTE: It usually is desirable that the smaller sprocket of the drive be one with hard surface teeth for longer life. Also, hardened teeth are recommended when the drive is operating over 600 r.p.m., when the driver sprocket has less than 24 teeth and the drive has a greater than 4:1 ratio, or when abrasive conditions are present.

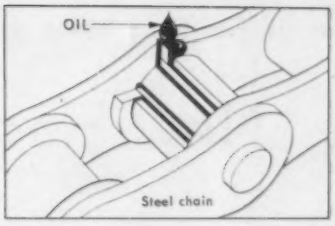
CAUSES OF AND CURES FOR FAULTY CHAIN DRIVE PERFORMANCE

Disorder	Possible Causes	What to Do
A. EXCESSIVE NOISE	1. Misalignment of sprockets	1. Check alignment and correct
	2. Too little or too much slack	2. Adjust centers for proper slack, or idler take-up
	3. Inadequate lubrication	3. Lubricate properly . . . check lubricating mechanism to be sure oil is reaching working parts
	4. Loose casings or bearings	4. Draw up all bolts, and brace casings if necessary
	5. Chain or sprocket worn out	5. Replace chain and/or sprocket (some sprockets can be reversed—slow speed drives)
	6. Too large a chain pitch size	6. Check chain drive recommendation chart
B. WEAR ON CHAIN SIDE BARS OR LINK PLATES AND SIDES OF SPROCKET TEETH	1. Misalignment	1. Remove chain and correct alignment of sprockets and shafts
C. CHAIN CLIMBS SPROCKETS	1. Poor fitting of chains on sprockets	1. Make sure sprocket bottom diameters are not oversize
	2. Chain worn out	2. Replace chain and sprockets (some sprockets can be reversed—slow speed drives)
	3. Insufficient chain wrap	3. Revise driver arrangement to get more sprocket teeth in contact with chain, or use idler take-up to increase wrap
	4. Excessive chain slack	4. Adjust centers or take-up for proper slack
	5. Material build-up in sprocket tooth pockets	5. Remove material build-up. Protect drive from contact with foreign material, or use sprockets with mud relief, pitch line clearance
D. BROKEN PINS, BUSHINGS OR ROLLERS	1. Chain speed too high for pitch and sprocket size	1. Use shorter pitch chain of equivalent or greater strength and/or check number of sprocket teeth to be sure it is within recommended limits for speed involved. Select a sprocket with increased number of teeth, if necessary
	2. Heavy shock or suddenly applied loads	2. Reduce shock loads (easy starts assure longer life)
	3. Material build-up in sprocket tooth pockets	3. Remove material build-up (see C-5)
	4. Inadequate lubrication	4. Lubricate properly
	5. Chain or sprocket corrosion	5. Protect from corrosion
	6. Poorly fitting sprockets	6. Check sprockets for wear and correct bottom diameter
E. CHAIN CLINGS TO SPROCKETS	1. Incorrect application or badly worn sprockets	1. Replace chain and sprockets
	2. Heavy or tacky lubricants	2. Clean and lubricate properly
	3. Material build-up on driver sprocket tooth pockets	3. Remove material build-up (see C-5)
F. CHAIN WHIP	1. Excessive chain slack	1. Install chain take-up or idler, or adjust centers
	2. High pulsating loads	2. Reduce load where possible or replace chain with one of suitable strength
	3. One or more stiff chain joints	3. Remove stiff links, or drive back on pins to provide proper clearance between side plates (also see G-1 to G-6)
G. CHAIN GETS STIFF	1. Misalignment	1. Check sprocket and shaft alignment (see C-1)
	2. Inadequate lubrication — causes wear	2. Remove chain if dirty or corroded. Clean and lubricate properly
	3. Corrosion	3. Protect chain from corrosion
	4. Excessive overloads	4. Reduce excessive overloads
	5. Material build-up in chain joint	5. Protect chain with case. Clean and lubricate more often
	6. Peening of side plate edges	6. Check for chain interference and correct
H. BROKEN SPROCKET TEETH	1. Obstructions, or foreign material in chain cases	1. Check chain and sprocket clearances. Remove foreign material
	2. Excessive shock loads, especially with small, cast iron sprockets	2. Reduce excessive shock loads, or use steel sprockets
	3. Chain climbing sprocket teeth	3. (See C-1 to C-5)
I. COTTERS COME OUT	1. Vibration	1. Reduce vibration
	2. Obstructions striking cotters	2. Eliminate obstruction, or tap in ends back until cotter fits snugly against side plates, or use riveted chain
	3. Cotters not installed properly (should be properly spread and drawn back snugly against side plate)	3. Correct faulty installation

Lubrication of Drive Chains

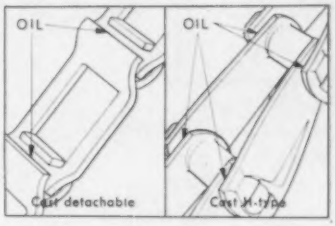
No drive chain can be expected to deliver the life built into it unless it is properly lubricated. It has been conclusively proved that the life of a drive chain may be extended greatly by proper lubrication.

The amount and type of lubrication are governed by the type of chain and the operating conditions involved. Generally speaking, the higher the speed of the drive, the more acute the lubrication requirement.

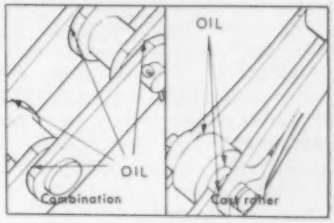


Steel Chain. Steel chains should be lubricated often enough to maintain a good film of lubricant on the wearing parts, which should be considered as moving machinery components. An ordinary thin lubricating oil will adequately penetrate into the chain joints. Heavy oil or greases do not penetrate sufficiently to be effective; they often close joint clearances, thereby preventing entry of correct lubricants.

The type of lubrication and the type of lubricating method are dependent on the speed of the drive. Use the chart on the following pages to find what classification your drive falls into, and then religiously follow the lubricating method recommended.



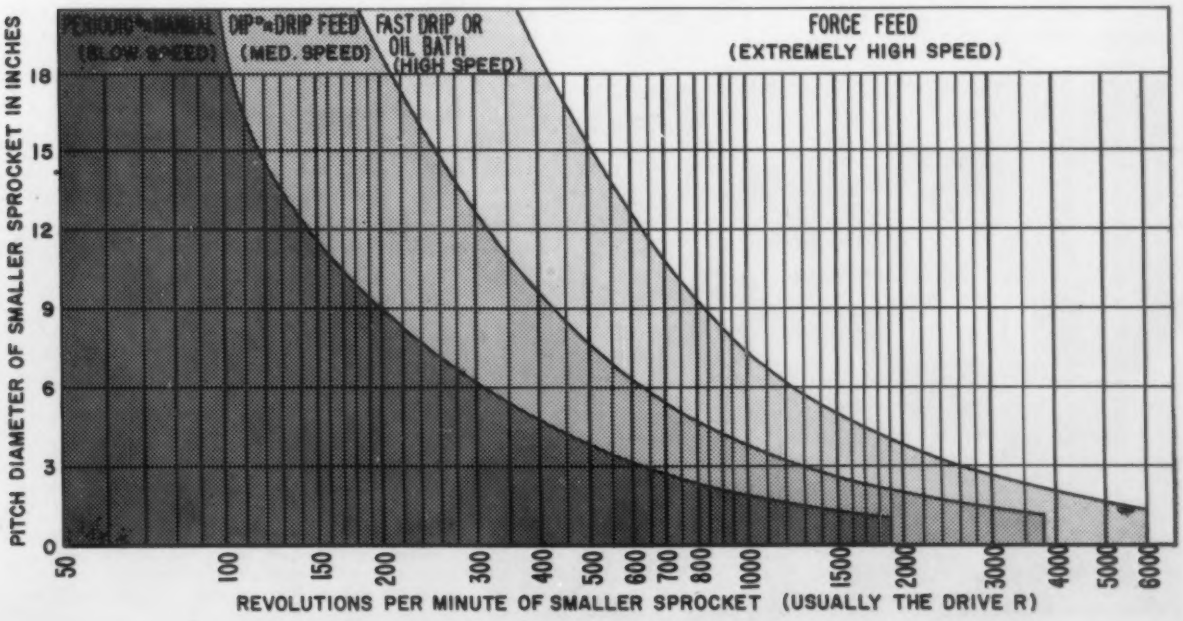
Cast Chain. It may appear that cast chain does not need as extensive lubrication as steel chain since it operates at slow speeds and does not have close precision fits. Nevertheless, even with the extremely slow-speed detachable or pintle chain drives, longer service is always assured if the surfaces of the chain are coated with a light lubricant at the time of installation. Use periodic brush lubrication to provide long life. Cast chains have joints relatively less hard than steel chains and therefore require equally as much and thorough lubrication.



Determining the Correct Type of Drive Lubrication

First determine the pitch diameter of the small sprocket in inches. Then determine the revolutions per minute of the small sprocket. Next, look at the chart below. Extend lines from the r.p.m. side and the pitch diameter side. The area where these lines meet will indicate the proper lubrication method of your drive.

Example: Pitch diameter, 6 inches; r.p.m. of small sprocket, 500. Lines meet in the area indicating drive requires dip or drip feed lubrication.



Nekoosa-Edwards Provides Automation in its Finishing Room with . . .

. . . New Electronic Spacer Installed on An Existing Guillotine Trimmer

Wayne Graham,
Finishing Supt.,
Nekoosa Edwards Paper Co.,
Potsdam, N. Y.

To increase production and reduce costs, numerous products have recently been made available to provide automation in the finishing room. Automation has often caused obsolescence of existing equipment and a consequent capital investment which usually requires a write-off over several years. After study, we installed a "Spacemastre" electronic automatic spacer manufactured by Smith & Winchester Mfg. Co. It can be used on any existing guillotine trimmer having a screw operated back gauge. This type of spacer was what we were looking for since our trimmer was in good condition, needing only the automation which this device provided.

The "Spacemastre" automated the machine for us at a small capital outlay. A new trimmer to give us the production increase and accuracy of cut-off required, would have cost a great deal more. In the future, should we purchase a larger trimmer, the same unit can be transferred to the new machine so our original smaller investment is protected.

Trimming is Faster, More Accurate

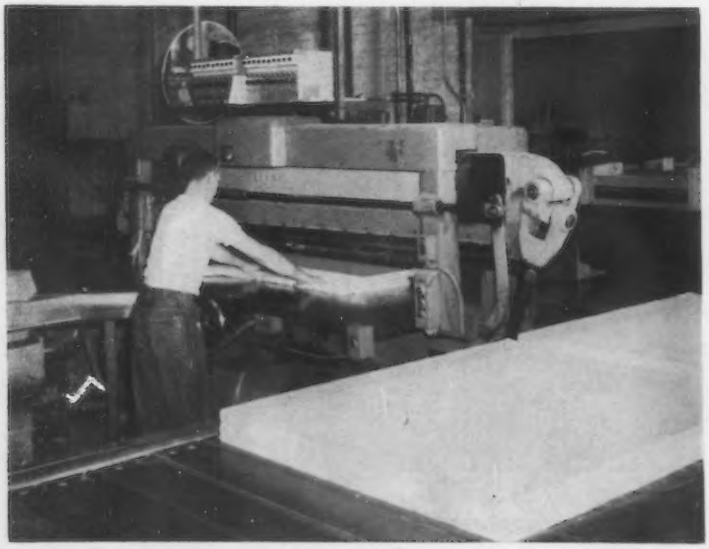
Faster, easier and more accurate trimming is made possible by the "Spacemastre" which employs a television type knob setting to feed any desired dimension to the unit. Electronically controlled, the spacer follows the program established by the operator, setting the back gauge for each cut to an accuracy of a few thousandths of an inch. The unit permits us to set up two programs, either of which the operator may select by positioning a switch.

Our unit has 20 positions, meaning that 20 dimensions can be fed to the programmer ahead of time. The operator uses only part of the dimensions as required for each load. After proper sequence of cut is selected on the programmer, all cycling is completely automatic. All the operator does is turn the paper as required to make the cut. Elimination of the time consuming job of manually setting each dimension results in greater production and accurate repetitive cuts. The programmer, although usually mounted on top of the trimmer, was isolated so that it would not be disturbed by vibrations. A new two speed, electro-magnetic reducer replaced the old drive for the screw.

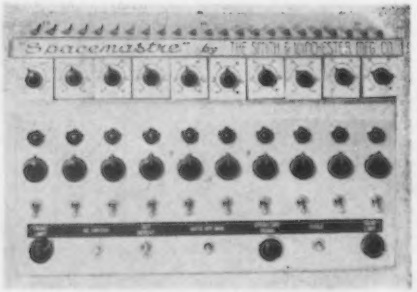
The "Spacemastre" compares the back gauge position with the position required by the preset control. This is done by translating linear dimensions into equivalent electrical resistances. These resistances are compared in a bridge circuit and any inequality or unbalance is amplified. This operates contactors which control the speed and direction of the two speed motor which drives the lead screw. Motion of the back gauge stops when the resistances are exactly equal. An additional safe guard requires the final position of the back gauge to be reached at very slow speed and always from the same direction.

Setting Dimensions

To set any dimension, the operator turns on one switch, leaving the bal-



FRONT VIEW of "Spacemastre" electronic spacer installed above trimmer



CLOSE UP of 10 position master programmer showing detail of operating components

A Nalco PRODUCT MANAGER

Answers Questions About Slimes in Pulp and Paper Mills

Facts about a tough, continuing paper mill problem

Slimes are expensive—whether they slow production, spot finished paper, produce foul odors, increase maintenance time and expense, or corrode equipment, they cost the papermaker money. Here are a few of the more common questions about papermill slimes and slime control, answered for you by J. R. Nelson, product manager of Nalco Chemical Company's paper chemicals department.

Question: What Are Slimes?

Answer: Microbiological slimes are deposits of substances exuded by microorganisms, and chemical slimes are accumulations of water-borne fibers and chemicals. Microbiological slimes serve as a binder for chemical slimes, which in turn harbor the microorganisms which produce microbiological slimes. Slimes, however, are *not* microorganisms, but rather are substances produced *by* microorganisms.

Question: Why is slime control difficult in the paper industry?

Answer: Because paper mill systems provide the food supply, moisture, darkened recesses, and temperatures ideal for slime growth. Some organisms, not considered slime-producers in other industries, become of serious concern to the papermaker because of these ideal growth conditions.

Question: How can slime be controlled?

Answer: By establishing and maintaining a complete slime control program, to include chemical and physical analyses of the troublesome deposits, a survey of the paper mill system, and the application of chemical and mechanical slime control methods.

Question: What are the major considerations in a slime control program?

Answer: Types of organisms, points of infection, and flow of infection. Microbiological analysis of slime deposits shows which particular slime-forming microorganisms (spore formers, non-spore formers, fungi) are present in a given system, and analysis of stream samples points out centers of infection and flow of infection. In addition, an overall engineering survey of the entire system should be made, including flow diagrams, information on chemicals and raw materials used, water consumption rates, points and quantities of white water usage, system temperatures, and pH conditions. All of this information is then coordinated into a program of control.

Question: Who does the coordinating?

Answer: Your Nalco field representative can do it for you. Working in your mill, with your personnel, he will determine the best overall slime control program for your particular system. In addition to his own skills and experience in slime control, the Nalco field representative has the skills, experience, and facilities of Nalco's laboratories to call on if necessary.

Question: What does Nalco offer in the way of slime control?

Answer: A wide variety of quality products, excellent customer service, and a solid foundation of slime-control experience and knowledge. Nalco slimicides are available for use under any number of conditions —against different types of slime formers, in acid or alkaline operations, for continuous, intermittent, or slug feeding. No single slimicide can control all kinds of slime under all conditions, but your Nalco field representative can find the right combinations of slime-controlling chemicals for your mill, and determine the most economical method of application. The Nalco field representative will serve as a slime-control consultant—and even if there is a question he isn't able to answer immediately, he knows where to go to get the information he needs: Nalco's laboratories.

J. R. Nelson, Product Manager
Paper Industry Chemicals Department

Question: Why are there occasional flare-ups of new types of slime, even where a slime control program is in effect?

Answer: Because microorganisms compete for food. As one type of microorganism is eliminated, more food becomes available for other types. Other organisms get more food, thus flourish. Also, new types of microorganisms may be carried into the mill system via air, water, or raw materials. That's why a slime control program must be a continuing effort, ready to counter and destroy any new type of organism as soon as it appears.

Question: What's new in slime control?

Answer: Among other things, Nalco's organo-sulfur slimicides, available in liquid (Nalcon 242 and Nalcon 248) and solid ball briquette (Nalcon 245) form. These Nalcon slimicides are effective additions to Nalco's proven line of slime control chemicals.

Question: What are Nalcon slimicides?

Answer: A combination of a potent organo-sulfur microbiological agents and powerful dispersants. The organo-sulfur agents destroy slime producers (especially effective on non-spore formers) while the dispersants have a dual function—they carry the organo-sulfurs to every part of the system, and they break up deposits of chemical slime. Nalcon slimicides aren't retained in finished paper, are non-phenolic and non-metallic. They have also been approved by the U.S. Food and Drug Administration for use in the manufacture of paper products to be used for food packaging.

Question: How quickly can an effective slime control program be established?

Answer: As quickly as you wish. Call your Nalco representative for prompt action, or write me for further details: J. R. Nelson, Product Manager, Paper Industry Chemicals Department.

"Nalcon" is a trademark of Nalco Chemical Company

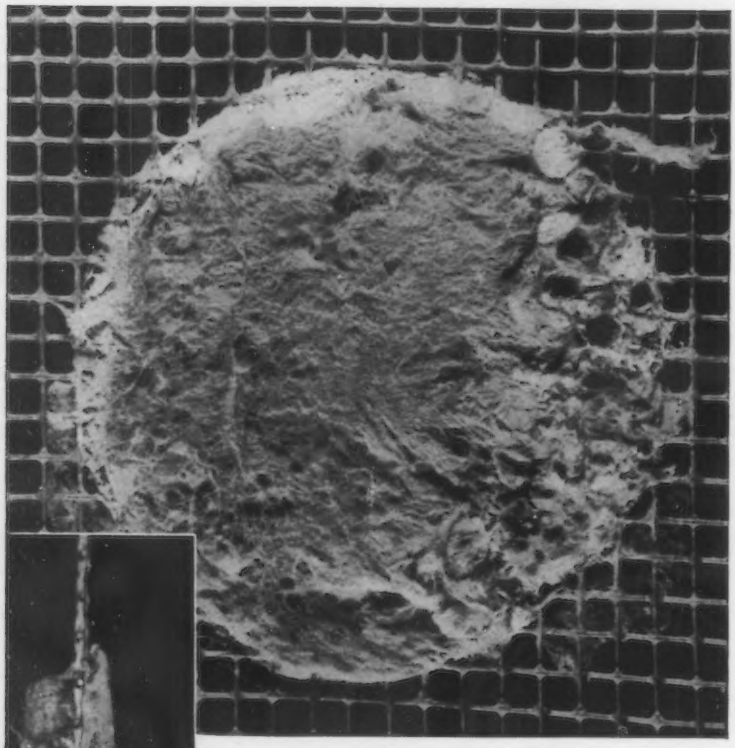
NALCO CHEMICAL COMPANY
6221 West 66th Place • Chicago 38, Illinois

Subsidiaries in England, Italy, Mexico, Spain, Venezuela and West Germany
In Canada: Alchem Limited, Burlington, Ontario

Nalco® ... Serving Industry through Practical Applied Science

Nalco CHEMICALS

We put a screen on the intake of a Nash Paper Mill Vacuum Pump for a few hours . . .



We were surprised, and so were the Mill Operators, at the fantastic amounts of foreign matter that will pass thru a Nash Vacuum Pump without injuring it, or in any way effecting the operation. Only a Nash Vacuum Pump can do this.

NASH
ENGINEERING COMPANY
South Norwalk, Connecticut, U. S. A.

ance of the switches off. When he rotates the control knob he causes an electrical unbalance between the programmer and the master potentiometer at the end of the screw. As soon as he turns the knob, the lead screw rotates until the master potentiometer is in exact balance with the preset potentiometer. This sets the back gauge at the required dimension.

It is not necessary for the operator to know anything about electronics. All he must know is that by rotating a knob the tape is moved. He stops rotating the knob when his desired dimension is reached. He writes this dimension on the erasable Teflon tape furnished with unit and other dimensions are set on other switches. This takes very little time since there are no tabs to pull and no tools required. Each unit is plug-in type and spare units for different dimensions on the programmer are kept at the machine. These may be changed in a matter of seconds.

The "Spacemastre" is a complete device in itself and has no interlocks with the knife operation. If the spacer should cease to function, a manual switch is turned on. Then, by using fast forward, fast return, and jog forward buttons the back gauge movement is manually actuated. The three buttons are connected to the two speed electro-magnetic reduction unit. The job button movements are very sensitive.

Repetitive Accuracy

We no longer find it necessary to adjust the movement of the back gauge by the handwheel as each dimension "homes" in with great accuracy on repetitive cycles. To avoid the operator's using the handwheel through force of habit, the spacer uses a magnetic brake on the lead screw. When the back gauge has cycled to the stop position, the handwheel can no longer move the tape. This brake is also a great aid when the operator jogs the ream against the back gauge since it prevents any movement of the gauge.

Two foot buttons are provided with the unit so that the operator can interrupt the sequence at any time he wishes or move the back gauge forward or back for ease in turning the ream for unloading. When the foot button is released, the back gauge automatically cycles to the desired dimension as dictated by sequence in the programmer.

With constant increasing costs for equipment replacement and increasing labor rates, this equipment is a welcome addition to our operation.

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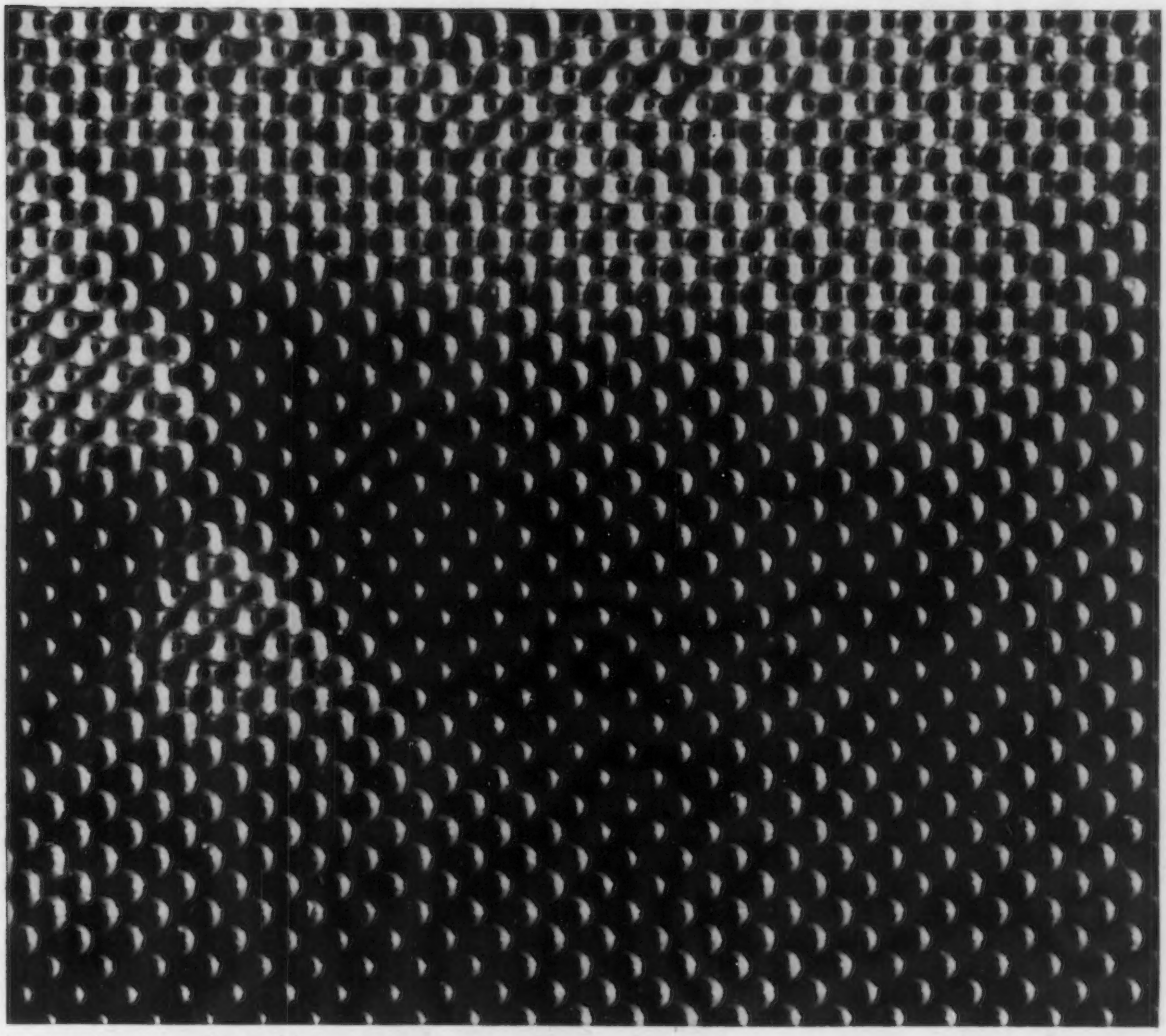

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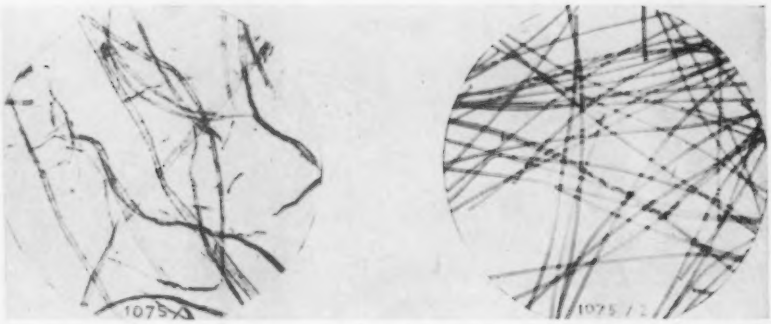
Swiss Mill Produces Paper Containing Substantial Quantities of Nylon

Ernest F. Barker,
European Editor,
Paper Trade Journal

The Zurich Paper Mill on the Sihl River in Zurich, Switzerland, has recently put on the market a new paper containing synthetic fibers, bearing the name "Syntosil." The new paper is based on incorporation of synthetic fibers in the furnish and it is produced on a standard fourdrinier machine. Syntosil displays remarkably high mechanical strength and water resistance. The latter property, a characteristic feature of this paper, is doubtless due to its synthetic fiber content and treatment with a binder.

Much interest is at present being displayed in synthetic paper and in the use of man-made fibers in paper manufacture. PAPER TRADE JOURNAL recently published (November 7, 1960, page 42, and November 14, 1960, page 44) two articles relating to this field. Only little has so far been written on the manufacture of synthetic fiber papers. It was therefore interesting to visit the Zurich Paper Mill on the Sihl in Zurich to learn details on the product, Syntosil.

The Zurich Paper Mill on the Sihl today is a small but progressive paper mill specializing in high-grade papers from rag and wood pulps. At present it operates three fourdrinier machines, and will install a fourth unit in 1961.



Microphotographs of typical nylon fibers (right). Chemical wood pulp at left for comparison.

Physical Properties of Syntosil

Syntosil reveals remarkable physical properties. The most outstanding are the high water resistance and the excellent strength properties. These properties are very much superior to those of conventional papers. As regards its appearance, i.e. opacity and surface quality, Syntosil is very similar to conventional paper and possesses excellent printing properties. Its appearance more closely resembles conventional paper than non-woven products which have of late been commercially available in major quantities. The firm intended not to turn out a non-woven fabric, but a product of papery nature having substantially improved properties. Syntosil's feel is slightly greasy—the result of the synthetic component. The National Topographical Institute, Berne, has printed a Swiss map on one of the first Syntosil papers. The map presented a very good appearance and the print was excellent. The editor, who received a copy, can confirm this. The map is a six-color offset print.

The following properties of Syntosil were mentioned: Average whiteness (90 GE). Opacity corresponds to that of a conventional paper. Resistance to abrasion of the wet paper is still substantially better than of paper treated in normal manner for wet strength. It is stated that Syntosil displays a high degree of resistance to alkalis, acids and chemical solvents; Syntosil was boiled at 70°F. in a 12 per cent caustic soda solution for 48 hours, and it was resistant to a 4 per cent muriatic acid solution. During these treatments, the tearing strength increased about threefold; Syntosil was further boiled in a soap solution without undergoing alteration as to its properties.

Two maps were scrubbed with soap, water and a stiff brush. Ordinary map (left) disintegrated. Syntosil map (right) remained intact.

Synthetic Fibers Used

Syntosil was developed in collaboration with the Société de la Viscose

(Continued on page 51)

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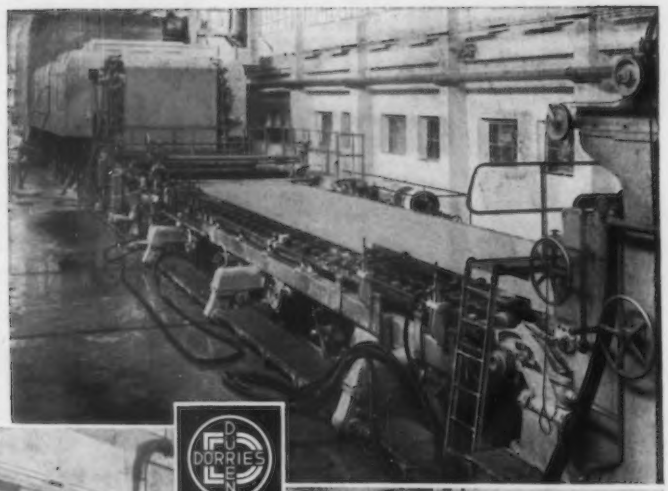

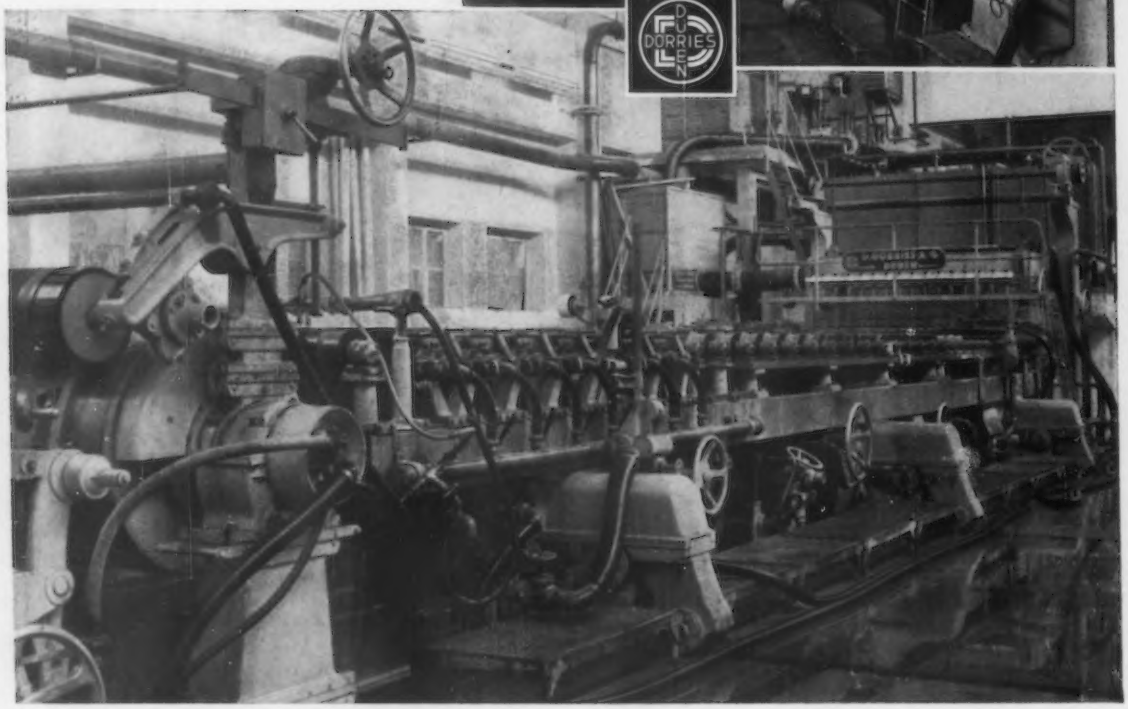

From planning to start

The photographs show a combination paper machine supplied in 1960 for M. G. and M. F. papers of different grades.

The mill has been fully planned and installed by us.

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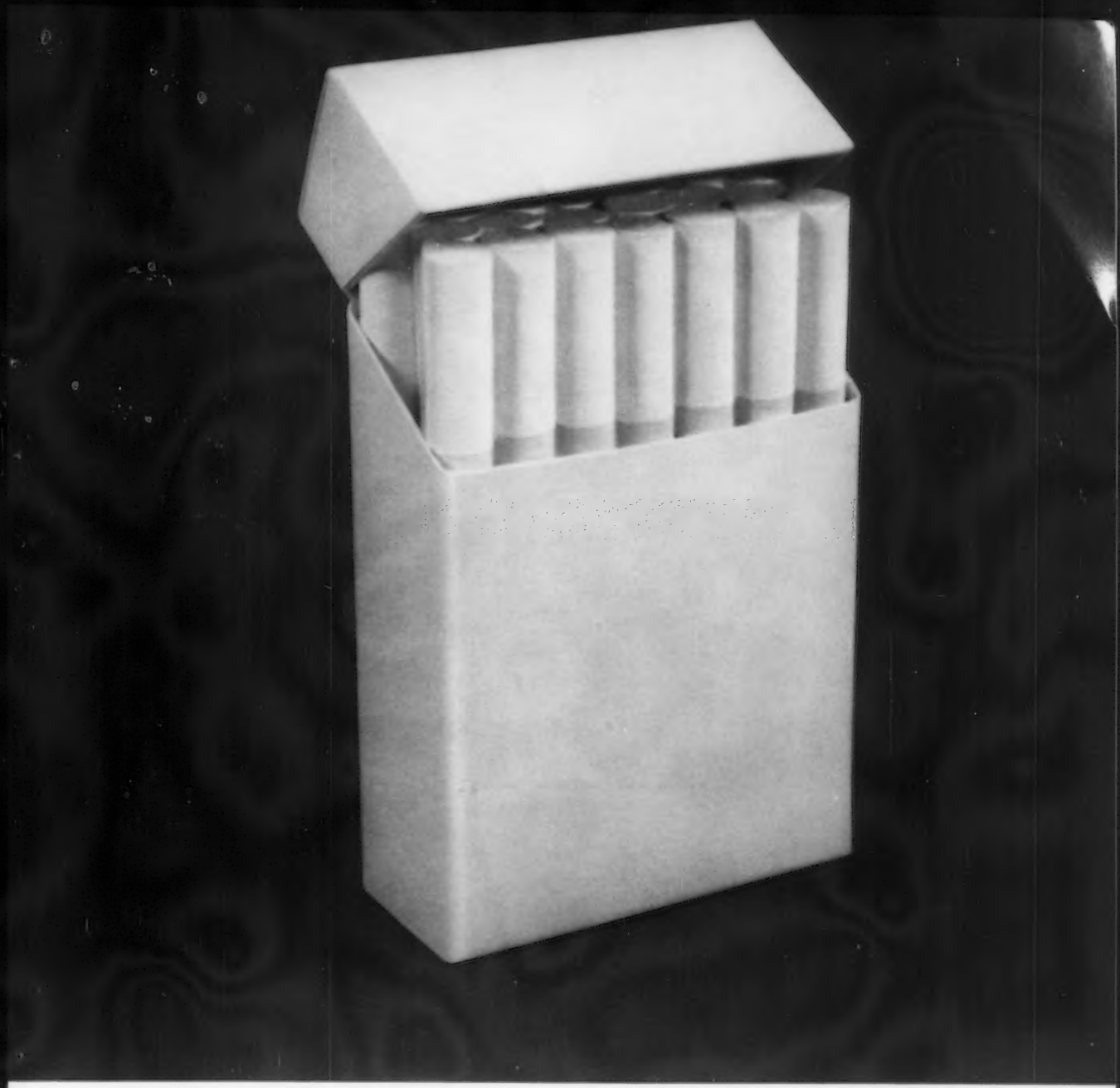

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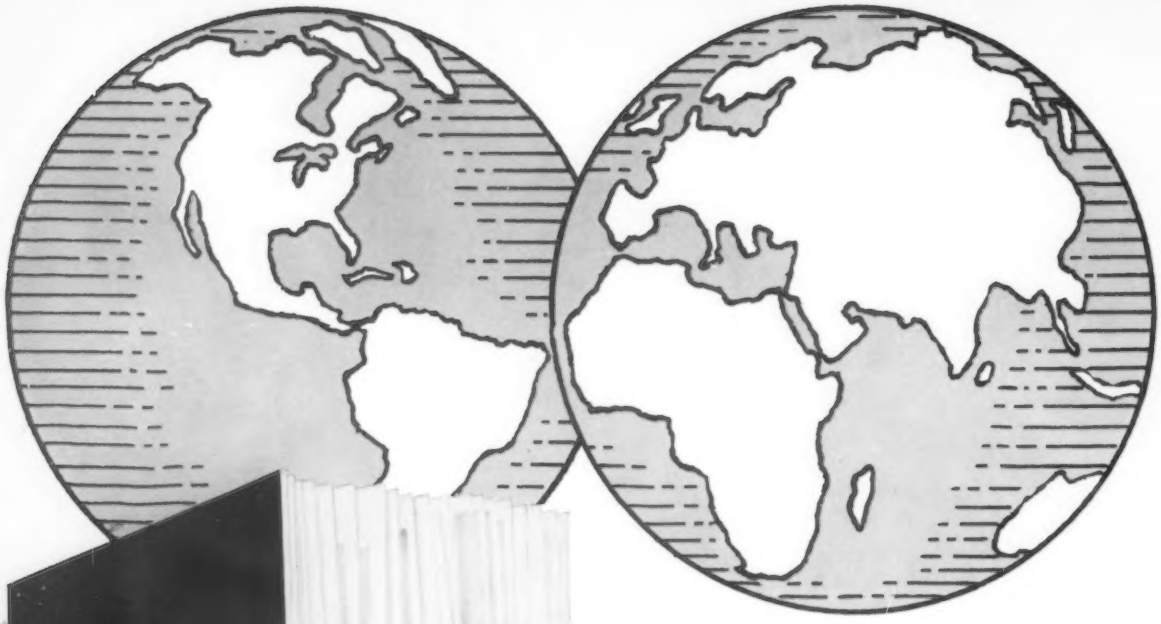

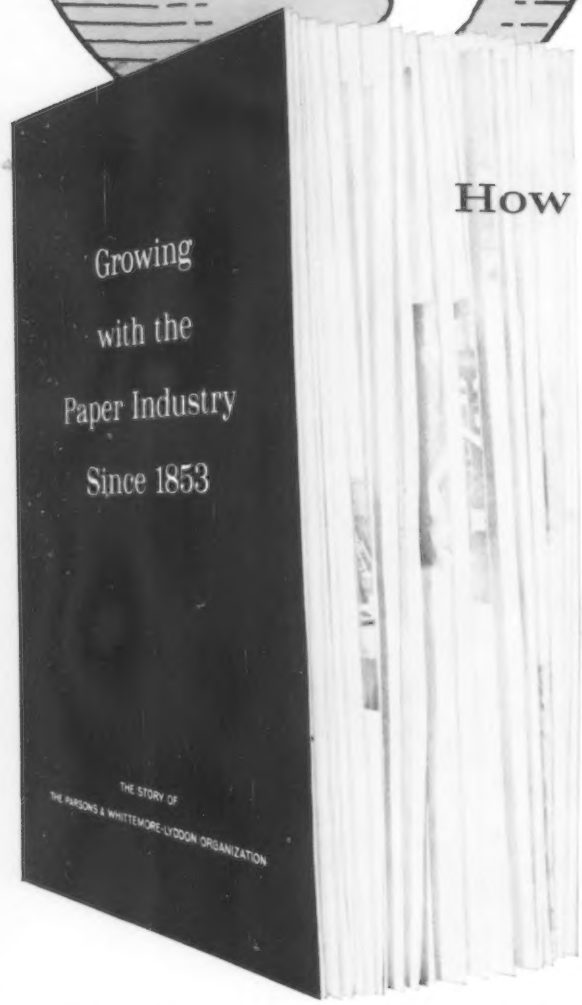

How Parsons & Whittemore develops Pulp and Paper Mill projects around the world

Business executives, industrialists and government officials often request information concerning the facilities and services of the Parsons & Whittemore/Lyddon Organization.

To meet requests for such data, we have published a new, 40-page brochure which outlines the world-wide technical, financial, engineering and machinery-manufacturing facilities of the Organization. The booklet, which should prove especially valuable to those seeking to establish a paper industry in newly-developing countries, describes 25 pulp and paper mill projects recently completed or in course of completion, on four continents, using twelve different raw materials.

We shall be pleased to send you a free copy of "Growing with the Paper Industry Since 1853." Address your request to any of our offices listed below.

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Swiss Mill . . .

(Continued from page 48)

Suisse, Emmenbrücke. The firm manufactures nylon and is the supplier of the special fibers incorporated in Syntosil. It may therefore be assumed that Syntosil contains nylon fibers. The physical properties of nylon are naturally reflected in those of Syntosil. As microscopic examination reveals, the length of the man-made fibers approximates that of conventional sulphite pulp fibers.

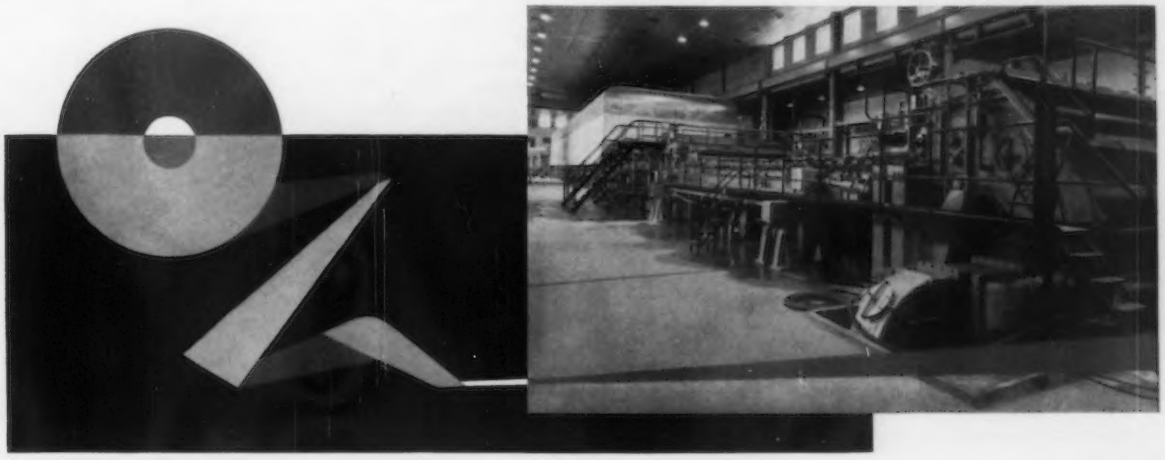
Tractor wheel runs over Syntosil map in mud.

Manufacture of Syntosil

As previously stated, Syntosil is manufactured on a standard fourdrinier machine. The water absorption of nylon fibers being quite different from that of wood fibers, paper manufacture initially presented serious difficulties. However, the mill finally succeeded in overcoming these problems and in marketing Syntosil. Bonding necessary to strengthen the fiber web is obtained by an addition of a plastic binder. Depending on the type of plastic materials used, the desired properties may be varied in certain respects.

The Zurich Paper Mill made this product commercially available a few months ago. It plans to establish world-wide distributing facilities. Another machine shortly to be installed will give added capacity to manufacture large quantities of Syntosil paper. Syntosil is available in various weights and colors.

A relatively high selling price is due to the high cost of the synthetic fiber. This is several times that of wood pulp. The mill feels that the price will not interfere with the applications of Syntosil's special properties for specialized uses.



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PJT NEWS OF SUPPLIERS

J. J. Waddock

J. L. Quackenbush

Clark-Aiken Co., Lee, Mass., manufacturer of machinery for pulp mills, paper mills and converters and a line of industrial materials-handling equipment, has announced the election of John J. Waddock as vice president in charge of sales. Mr. Waddock joined Clark-Aiken at the completion of his army service in 1946. He advanced from shop production work to purchasing agent in 1951 and then to the sales department. For the past five years he has served as sales manager.

Perkins-Goodwin Co., international pulp and paper marketing-management organization, announces that John L. Quackenbush has been elected a vice president in charge of its Chicago office.

Sandoz, Inc., New York, announces that the first showing of a Sandoz motion picture in color, featuring new developments in the paper field, was held at the Waldorf-Astoria Hotel on Wednesday evening, January 25. The guest list for this premiere of "New Developments for Modern Living" includes chief executives from companies and associations in the paper and textile industries.

The film shows a number of new developments, with emphasis on the latest of the company's Leucophor products, which enables paper manufacturers to offer a fluorescently brightened paper which appears "whiter than white." As a corollary to the Sandoz Leuchphor development, the motion picture also shows other new developments, not only in the paper field but also in the allied industries of textile and leather, where the company's products are also used.

Among the organizations whose plants and products are shown in the movie, Mr. Lindenmaier named; Clupak, Inc.; West Virginia Pulp & paper Co.; Strathmore Paper Co.; Whiting-Plover Paper Co.; The Grand Union Co.; Northern Dyeing Corp., and Skinner Textiles.

The film was produced for the Chemical Division of Sandoz, Inc., by Riverside Pictures, North Hackensack, N. J.

Taylor Instrument Companies, Rochester, N. Y., will begin operation of its newest subsidiary in April of this year. Taylor Instrument Mexico, S. A., is located less than six miles from Mexico City.

Frank Ward, vice president of foreign operations, has named Edward J. Hanna of Rochester to the post of general manager. Mr. Hanna joined the company in 1926 and spent most of his career as an application engineer.

The new company will do some local manufacturing and handle instrument assembly and repair. To the present the Taylor operation in Mexico has been handled by Martinez S. de R. L. Personnel from this organization will continue to handle sales in Mexico.

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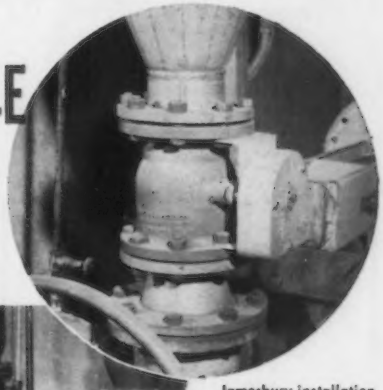
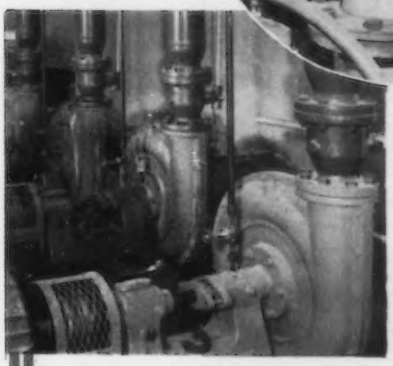


Jamesbury installation at Weyerhaeuser Longview Plant



Jamesbury installation at Mead Corporation Chillicothe Plant

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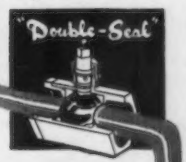

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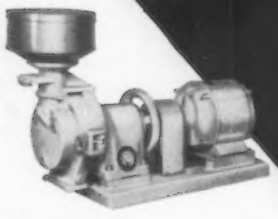

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Kraft, Unbl.	117.50/125.00	125.00/ —	125.00/130.00	125.00/ —	
Sulphite, Blchd.	‡135.00/140.00	‡135.00/140.00	140.00/ —	140.00/ —	140.00/ —
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4	6.50/5.75	6.50/6.25	6.50/6.25	6.50/6.25
5	5.75/5.25	5.75/5.50	6.00/5.50	— /6.00
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	New York	Boston	Chicago	Los Angeles
	Feb. 6	Feb. 6	Feb.	Feb.
No. 1 Mixed Paper	$ 7.00/ 9.00	4.00/ 7.00	6.00/ —	12.00/ —
No. 1 News	12.00/ 13.00	11.00/ —	11.00/ —	13.00/ 14.00
Overissue News (Lg. size)	11.00/ 13.00	9.00/ 11.00	16.00/ —	18.00/ —
Mill Wrappers	19.00/ 22.00	9.00/ 11.00	9.00/ —	13.00/ —
Old Corrugated Containers	19.00/ 20.00	17.50/ 18.00	18.00/ —	17.00/ —
Super Resorted Kraft Paper	35.00/ 40.00	— / —	28.00/ —	50.00/ —
New Double Kr. Ld. Corr. Cuts	27.50/ 30.00	30.00/ 32.50	30.00/ —	27.50/ —
(Semi-chem. medium)	45.00/ —	45.00/ —	42.50/ —	— / —
New 100% Kraft Corr. Cuts	40.00/ 42.50	— / —	52.50/ —	— / —
New Br. Kraft, Env. Cuts	65.00/ 70.00	65.00/ 70.00	47.50/ —	45.00/ —
New Br. Kr. Bag Waste Prntd.	50.00/ 55.00	50.00/ 60.00	47.50/ —	35.00/ —
New Br. Kr. Bag Waste Unprintd.	55.00/ 60.00	60.00/ 65.00	55.00/ —	42.50/ —
No. 1 Groundwood Shvs.	25.00/ 30.00	20.00/ 25.00	10.00/ —	30.00/ —
White Newsblanks	42.50/ 45.00	47.50/ 52.50	30.00/ —	55.00/ —
No. 1 Soft White Shvs.	55.00/ 60.00	55.00/ 60.00	50.00/ —	75.00/ —
Super Soft White Shvs.	65.00/ 75.00	70.00/ 80.00	60.00/ —	— / —
Hd. White Shvs.	75.00/ 80.00	80.00/ 90.00	75.00/ —	80.00/ —
Hd. White Env. Cuts	90.00/ 95.00	100.00/105.00	80.00/ —	103.00/ —
Col. Tab. Cards	40.00/ 42.50	40.00/ 42.50	35.00/ —	35.00/ —
Manila Tab. Cards	57.50/ 60.00	57.50/ 60.00	55.00/ —	60.00/ —
No. 1 Col. Ledger	32.50/ 35.00	30.00/ 35.00	35.00/ —	18.00/ —
White Ledger	45.00/ 50.00	42.00/ 47.00	45.00/ —	40.00/ —
Mixed Book & Mag.†	— / —	— / —	8.00/ —	— / —
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Dryden's Other Specialties—formulated to meet many unusual requirements. (We produce pulps for anti-tarnish papers, for example.)

We would be glad to make up a single boxcar shipment of several of our pulps for you to try in your own operations.

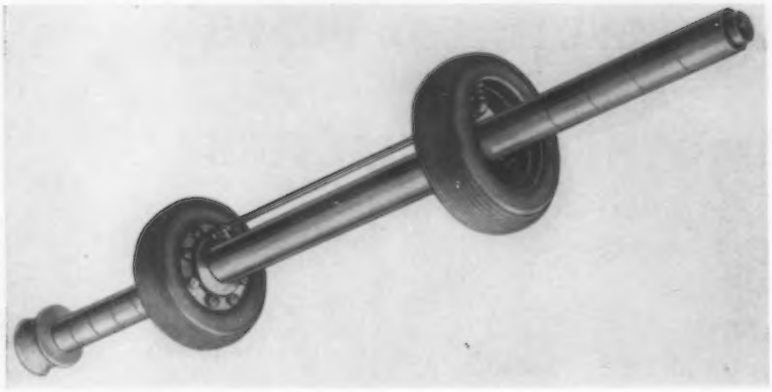
DRYDEN PAPER COMPANY, LIMITED

DRYDEN, ONTARIO, CANADA

SOLD BY: **Anglo Paper Products, Ltd.**

2055 Peel Street, Montreal 2, Quebec

NEW EQUIPMENT & SUPPLIES



Core Mandrel Has Expanding Rubber Tires Along Shaft

The Perfection Pneumatic Mandrel roll is a shafting device where two or more patented air units are mounted upon the mandrel and connected in series by a hose to a source of air pressure at one end.

Air unit tires are deflated when mandrel is inserted into roll core. When mandrel is in place, air pressure is applied to inflate tires, which then grip inside of core. Roll slippage, with its associated winding and feeding troubles, is said to be eliminated. Rolls revolve on a true center, permitting high-speed machine operation.

Two, three or four air units are keyed to shaft and locked in place by set screws. Units may be positioned anywhere along the length of the mandrel, to accommodate different core lengths. Just loosen set screws, slide units along keyway in shaft, and retighten. The mandrel is lightweight; a 72-inch mandrel with three 5-inch air units is claimed to weigh less than 75 pounds. Choice of tire sizes are available from 5 to 24 inches. Air units are supplied in a choice of steel, aluminum, or extra light magnesium hubs. Shafts are made of stress-proof, ground and polished steel. The mandrel is regularly supplied with standard snifter valve and ¼-inch, 3-ply Neoprene air hose. Air pressure required is 75 p.s.i. The mandrel can be made to any practical length, and engineered to handle any load weight. A wide choice of accessories include hardened steel bushings, drive pin, V-pulley hub, etc. Contact Perfection Tool and Mfg., Inc., 209 Baldwin Road, Kalamazoo, Mich.

Pinch Valve System Can Be Automated

A system for automatic opening and closing of pinch valves is announced by Mine and Smelter Supply Co., 3800 Race St., Denver, Colo. Consisting of one or more Massco-Grigsby hydraulically operated pinch valves with individual hydraulic control valves, a single hydraulic power source serves all pinch valves in the system.

The hydraulic control valve for opening each pinch valve may be operated manually or by a solenoid. Either type may be remotely located. The solenoid operated control valve may be actuated by pushbutton or through interlocking relay from other electrical circuits.

The power source is a hydraulic pump which may be operated by normal plant air supply or electric motor. The air operated pumps are low displacement type for normal pinch valve speed of closure. The motor operated pumps can be supplied in low or high displacement types—the latter are used for rapid pinch valve closure.

For rapid operation of the pinch valve, accummulators can be added to the control circuit. They can be applied to individual pinch valves or to part or all of the pinch valves in the system.

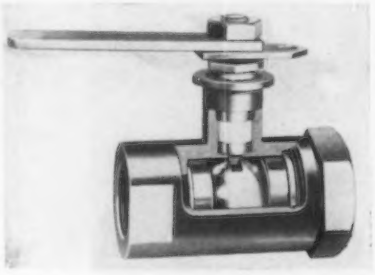
Where pinch valve operation is infrequent or it is necessary to disconnect the motor operated hydraulic pump, a holding valve can be installed at the closing mechanism. If dust or moisture conditions are severe, bellow type boots can be supplied to protect the piston rod.

Limit switches can also be supplied on the closing mechanism to indicate fully opened, fully closed, or both.

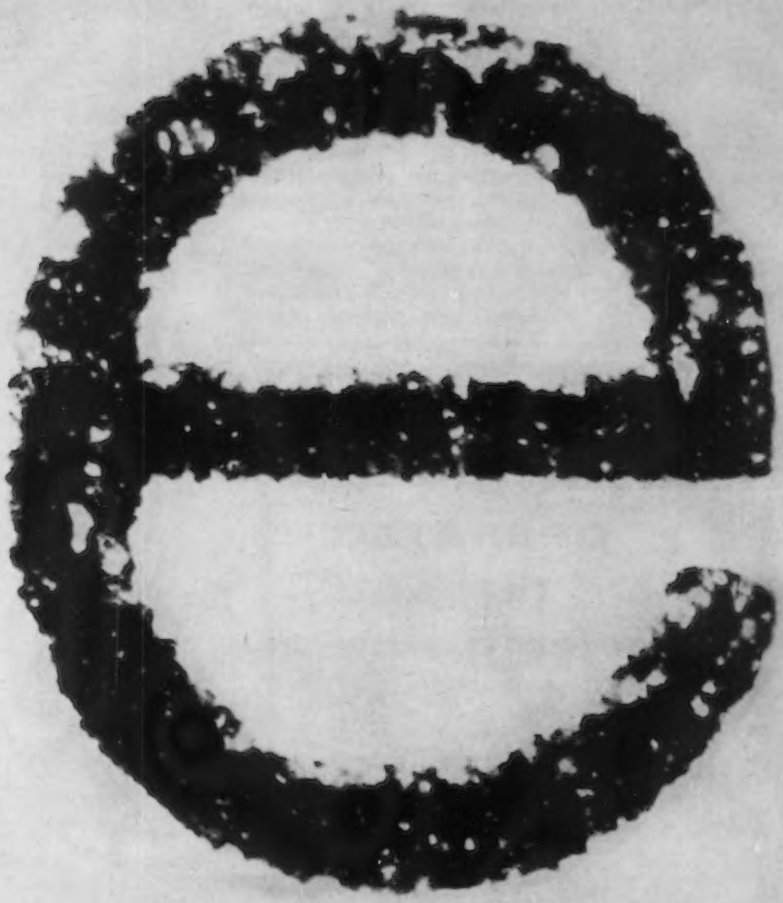
The valves may be the same, or different, size; they may be operated simultaneously or independently; and they may be coordinated and interlocked with other plant equipment to automatically control tank levels, rate of flow, etc. The basic Massco-Grigsby Pinch Valve is available with sleeves made of rubber, neoprene and specially compounded rubber, in sizes from 1 to 14 inches I.D.; with line pressure ratings of 50, 100 and 150 p.s.i. and temperatures to 200° F.

Ball Valves Offered in Combination of Materials

A line of ball valves in combinations of metals, seats and seals to handle practically any fluid, is an-



nounced by Homestead Valve Manufacturing Co., Coraopolis, Pa. Featuring adjustable stem seal, a self-adjusting ball which seals with flow in either direction, and stem shoulder to prevent ball from being forced downward, the line includes valves with Navy G bronze or semi-steel cast bodies; or brass, steel, and 303 or 316 stainless steel bar stock bodies. Both the cast and bar stock types have full-round pipe-sized passage for fluids, or restricted passage as desired. Offered now with flexible self-forming Teflon seats and seals, they will soon be offered in other materials such as: rubber, polyethylene, or Kel "F". Valve sizes range from ¼ to 2½ inches for pressures up to 400 pounds water-oil-gas, and temperatures to 450°F.



Guard your coated papers against surface rupture!

In today's modern high-speed printing, a roll of paper may pass through the press at rates as high as 1,200 feet per minute! Some coatings can't stand these high speeds and rupture. Koppers new DYLEX® K-54 latex gives coated paper the superior bonding strength it needs. ☐ DYLEX K-54 gives coated paper a higher degree of smoothness. The paper prints *clearly* without defects. Paper coated with DYLEX K-54 has excellent mechanical stability and high moisture resistance. This latex blends well with your other coating ingredients, foams less and is easy to apply. ☐ DYLEX K-54 is another of a series of latices designed to meet all your paper coating needs. For more information, write to Koppers Company, Inc., Plastics Division, Dept. 2502, Pittsburgh 19, Pennsylvania.

KOPPERS PLASTICS

V-S Drives Embody Several Features

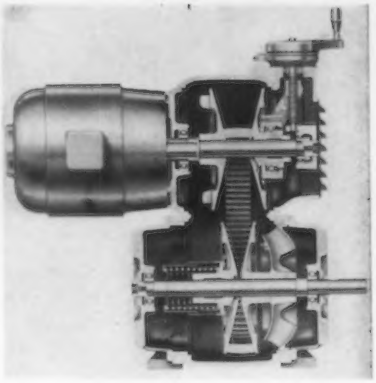
The Industrial Products Division of Western Gear Corp., Belmont, Cal., announces the complete line of mechanical variable speed drives which it is marketing under the trade name "Vari-Master".

Vari-Master is available in three sizes, covering the horsepower range of from 1 to 10 h.p. with a wide speed range of up to 8 to 1 ratio of speed variation. Vari-Master is offered in both drip proof and totally enclosed construction. A standard, NEMA 'C' face motor, with standard shaft extension is utilized. The motor can be of drip proof, totally enclosed or explosion proof design.

The Western Gear Vari-Master embodies a number of engineering features; for example, a fan is used on the variable speed shaft to cool the belt. Disks are positively positioned by shaft shoulders to prevent belt misalignment. The constant speed disk assembly is saddle mounted on its own bearings.

All bearings are double sealed, permanently lubricated. Shafts and keys are heavy chrome plated and ground to close tolerance. Disks have large grease reservoirs. "Stuck disks" are said to be practically eliminated.

This helical gear reducer is offered



in double, triple, and quadruple step Straitline gear reduction, providing a large selection of output speeds. It is offered in a wide variety of assemblies, both horizontal and vertical. Vari-Master can be equipped with manual (handwheel) control, electric remote (push button) control, or pneumatic automatic control. A wide variety of speed indicating tachometers are available.

GILBERT and NASH AIR OPERATED felt and wire guide

New . . . Simple . . . Compact.
Now operating on machines at speeds over 2,000 fpm, the Gilbert and Nash Air Guide reacts quickly with reliability and precision.

Although entirely air operated, this new guide uses air only when a correction is made. What's more, "swing roll" effect or guide roll oscillation is completely eliminated.

Guide roll is held stationary if air supply is interrupted . . . there are no springs to pull guide roll with possible damage or loss of wire or felt.

Complete standardization of *all* guides can be easily accomplished because the same model air guide is used for wires, wet and dryer felts.

We invite you to request for our representative to call.

Manufactured and sold exclusively by —

APPLETON MACHINE COMPANY
APPLETON • WISCONSIN

SPLIT-EYELET CONNECTORS are used in place of reducer tees, and to connect such parts as spray nozzles, gauges, and hose nozzles in installations requiring fittings for 1¼, 1½ and 2 inch piping or equivalent size tubing. Split clamp is made of cadmium plated, heavy-gauge steel or of stainless steel. Bodies provide a ½ inch NPT female outlet and are made in choice of brass and stainless steel. The connectors are mounted simply by drilling a 11/16 inch diameter hole in the pipe or tubing and placing the connector in position. Twin-bolt compression of the clamp in combination with a special Buna-N gasket provides a leak-proof seal and may be used for liquids and gases up to pressures of 150 p.s.i. Spraying Systems Co., 3220 Randolph Street, Bellwood, Ill.

Continuously Records Basis Weight Without Moisture Errors

An electronic device said to be the first to measure basis weight continuously, and without "moisture errors" has been developed by PolyTech Research Inc., 25 N. Texas St., Orlando, Fla. It was explained by the inventor, W. E. Barker, Jr., president of PolyTech, that until now, gauges using Beta sources and X-ray equipment have had the same problem: inaccuracy due to moisture error.

Design of the electronic gauge is based on Mr. Barker's discovery that a portion of the spectrum near the infra-red region and around 7500 angstroms will not pick up moisture errors, and is capable of measuring the weight accurately whether the paper be soaking wet or bone dry. A radiant energy beam of the selected wave length in this region is passed through the sheet of paper on the production line. It measures by selective absorption only the solids and fiber content.

The beam is transmitted from an emitter on one side of the paper, and picked up by a detector on the other side of the paper, so that no direct contact with the paper is necessary. Variations of the beam intensity, which are caused by variations in paper weight, are translated into electronic signals. These are amplified in a special frequency response amplifier. Simultaneously, moisture content of the paper is measured by a beam at another wave length. This information is correlated with that from the paper weight to give a net moisture content.

Display modes on the master controls include two strip chart recorders: one for the basis weight, another for moisture content. Between the two, a cathode ray tube divided into 18 sections (one for each head) will display in light dots the variation from norm, giving a profile of what the weight of the paper is across the sheet. Strip charts which only look at one channel at a time can switch to any channel.

The heads, each containing an emitter and detector, are spread across the paper at one-foot intervals. This gauge system will be able to hold to better than one per cent error, according to PolyTech. Present plans call for the gauge to be sold or leased to paper mills, through an associated sales and manufacturing firm.

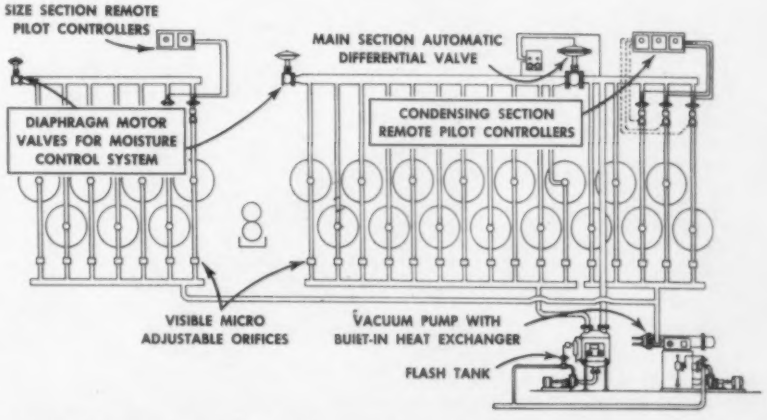
Rotor Said to Double Defibering Efficiency

A Hydrapulper rotor which doubles defibering efficiency is announced by The Black-Clawson Co., Shartle Division, Middletown, Ohio.

The Vokes Rotor provides optimum performance for split rolls, slab, sheet-trim broke, bale and bulk furnishes, wet strength, as well as in blending mixing. A full consistency range provides for batch or continuous operation. Extraction and dump openings are non-plugging.

Of heavy duty construction, the rotor body is a solid one-piece casting, with defibering blades attached by heavy cap screws. The bedplate is a precision casting of high wear resistant stainless alloys with which the defibering blades coact in an attritioning action. Extractor slots or round holes can be provided for continuous extraction via direct connection to the dump pump. There is complete dumping of all defibered stock on a batch operating basis.

The Vokes Rotor operates at close tolerance with the bedplate, or attri-

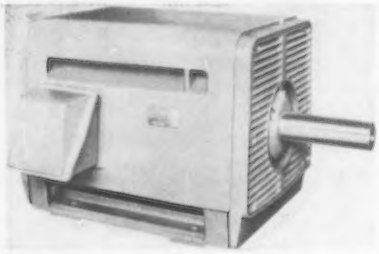

SIZE SECTION REMOTE PILOT CONTROLLERS
MAIN SECTION AUTOMATIC DIFFERENTIAL VALVE
DIAPHRAGM MOTOR VALVES FOR MOISTURE CONTROL SYSTEM
CONDENSING SECTION REMOTE PILOT CONTROLLERS
VISIBLE MICRO ADJUSTABLE ORIFICES
VACUUM PUMP WITH BUILT-IN HEAT EXCHANGER
FLASH TANK

DRYER DRAINAGE SYSTEM, designated as Type 3, is a three-section system that is said to cost less than any other comparable equipment to buy, install, operate and maintain because it uses fewer flash tanks, pumps, motors, controls, control valves, and accessories. Savings on equipment and engineering costs alone usually run between 10 per cent and 70 per cent. An exclusive visible micro adjustable orifice shows the flow of condensate from each dryer, thus revealing hidden trouble and permitting precise control of drainage. The system is designed for paper machines operating on medium and low pressures, and on vacuum. Stickle Steam Specialties Co., 2215 Valley Ave., Indianapolis 18, Ind.

tion ring, which is adjustable to obtain optimum performance over a long wearing life. The Vokes Rotor may be purchased as standard equipment for all new Hydrapulpers, and is also available as a conversion unit for some existing models.

Motor Stows Round Stator in Square Frame, Gets Better Cooling

The Reliance Electric and Engineering Co., 24701 Euclid Ave., Cleveland, Ohio, has put a round peg



in a square hole to reduce the overall size of large a.c. motors.

This motor, called the Duty Master D-5000, has a round stator inside its nearly square frame. This unusual arrangement is said to provide better cooling, permitting using a smaller overall dimension for any given horsepower rating.

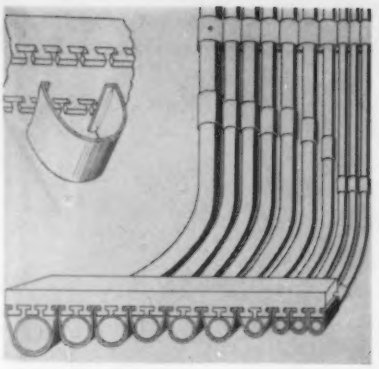
The D-5000, which is available from 125 through 300 h.p., has large air intakes which cover each end of the motor. Air is drawn in these louvered openings, ducted through the rotor and stator, and then exhausted at the sides. Class B insulation is standard and frames and end louvers are cast iron. The louvers can be removed for inspection and maintenance.

The motor is being offered with either sleeve or ball bearings. Drip-proof enclosure is standard, but splash-proof enclosures can be specified. In addition, encapsulated stators are available for severe conditions. Either 220, 440, or 550 line voltages are available for 3600, 1800, 1200 and 900 r.p.m. operation.

Conduit Hangers Cut Installation Time, Costs

A hanger for banks of electrical conduit and pipe, designed to cut costs and offer improved construction features, is announced by the Stamperhanger Co., 1634 Telegraph Ave., Oakland 12, Calif.

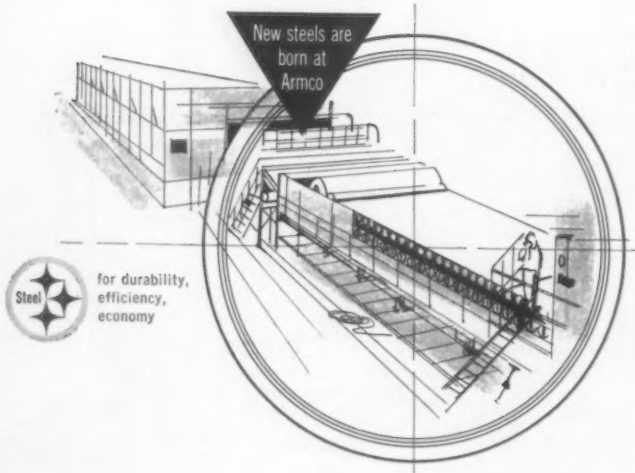
Installation cost of the Stamper-



hanger is about one-quarter that of ordinary hangers, according to president George F. Stamper. Other features include one piece clamps, immediate and automatic alignment that is permanent even though workmen step on the pipe, interchangeability of pipes within the bank without moving adjacent pipes, a wide variety of sizes. Clamps are small in bulk and nest together.

Conduit or pipe is held against a channel iron by spring alloy aluminum clamps which merely slide over the pipe and are held by slots in the channel. A cam on the clamp holds it in place.

For Machine Furnish, White Water, Vacuum, Steam Systems...



Armco can meet your Paper Machine Pipe Needs

Armco Welded Steel Pipe is supplied pre-fabricated, with every bend and coupling, to meet your *exact* system specifications. Here's how ready-to-install Armco Pipe Systems help save money.

Installation time is sharply reduced, and your systems have a minimum of flanged couplings to maintain. Smooth pipe interiors increase the efficiency of your operation and quality of your products.

For price, technical and installation data, write Armco Drainage & Metal Products, Inc., 5211 Curtis Street, Middletown, Ohio, without cost or obligation.

ARMCO Drainage & Metal Products

PJT NEW LITERATURE

Falk Steelflex Couplings

Presents Falk's complete line of torsionally resilient Steelflex couplings. New pages, additional coupling types, dimensions for larger sizes, and easier methods of selection are included. How Falk's unique grid-groove coupling design protects connected machines against shock, vibration, and misalignment is explained and illustrated. Charts and tables, appearing throughout the bulletin, contain up-to-date engineering data. Bulletin 4100. The Falk Corp., Box 492, Milwaukee 1, Wis.

Bailey Control Linkage

Illustrates typical linkage arrangements for fan damper control, stoker speed control, coal feeder gate control and feed pump fluid coupling control. Drive levers and driven levers are discussed and explained with line drawings and dimension charts. Also, discusses connecting links, bearings and shafts, cable connectors, and cable and pulley connectors. Brochure #P81-5. Bailey Meter Co., 1050 Ivanhoe Road, Cleveland 10, Ohio.

Comfort Heating

Describes new line of electric infrared comfort heaters for direct radiant heating of hard-to-heat indoor and outdoor areas without costly heating of the intervening air. A new approach to heating problems. Many advantages such as lower installation costs, lower maintenance costs, silent, clean and healthful, instantaneous response. Bulletin. Fostoria Corp., 1200 N. Main St., Dept. 87, Fostoria, Ohio.

Chronoflo Telemetering

Gives basics of transmitter and receiver operation in a time-duration impulse system. Pictures and describes Chronoflo transmitters and receivers, as well as accessories. Many advantages, high accuracy, built-in flexibility, rugged construction, fast response, easy installation. Bulletin 230.20-2. B-I-F. Industries 345 Harris Ave., Providence, R.I.

New Type C Rotary Joints

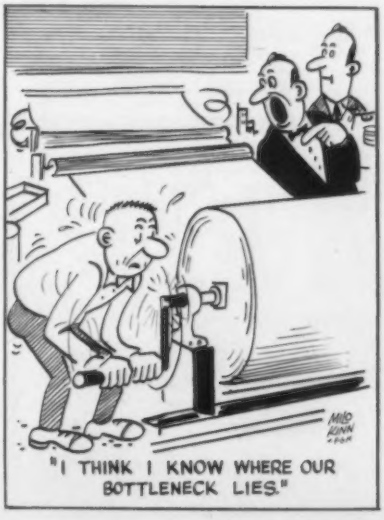
Describes rotary joints that require no lubrication, work equally well for single flow or syphon steam service, and handle steam and virtually any fluid ranging from chilled water to 600°F. oil. Detailed recommendations are also included on the proper installation. Provides increased economy and all the advantages you want. Bulletin 310B. Barco Manufacturing Co., Dept. RJ-37, 500 Hough St., Barrington, Ill.

Two Standard Heat Exchanger Lines

Describes types CP units in 6-in. through 31-in. sizes and the CPR units in 6-in. through 17-in. sizes. Type CP are assembled from pre-engineered and stocked components, giving much latitude in choice of tube sizes, tube pitches, baffle spacing and nozzle location. CPR type units are built from pre-engineered and stocked CP parts with limited sizes and nozzle orientations which will meet the more common commercial heat transfer applications. Bulletin 302.1K1. American-Standard, Industrial Division, Detroit 39, Mich.

Combination Cleaner-Snubber Unit

Tells how the unit is designed to be used in place of separate air intake filters and silencers for reciprocating compressors, positive-displacement blowers, and naturally-aspirated or positively-scavenged gas or Diesel engines. It offers substantial advantages by eliminating extra piping, operation and maintenance. Designed for any air capacity. 6 pp. Bulletin. Burgess-Manning, 9207 Sovereign Row, Dallas 7, Texas.



Rotary Feeder

Describes rotary feeder for delivering and controlling the feed rate of dry, pulverized, and granular materials into high pressure pneumatic conveying systems. The "Dual Air-Inlet DA Feeder," is Fuller's latest addition to the field of dense stream conveying. It delivers into low air volume, high pressure systems with efficiencies as high as 98.4 per cent. Included are photographs, dimensioned drawings and specifications for all sizes of DA feeders. Bulletin F-8. Fuller Co., Catasauqua, Pa.

Straightline Sludge Collectors

This publication enables selection of the proper size tank for both the type "H" and type "L" sludge collectors. New mechanical details and arrangement drawings of various designs for both collectors are illustrated and described. Adaptable to Uniflow settling tanks and pre-aeration settling tanks. Uniform straightline action assures maximum efficiency . . . . minimum disturbance of flow. Bulletin 2746. Link-Belt Co., Dept. PR, Prudential Plaza, Chicago 1, Ill.

R/M V-Belts

Details design features and performance advantages of all R/M V-Belts. Included are R/M Candor V-Belts, R/M FHP V-Belts both offering special designs for heavy and light duty, short and long center applications. Also described are Condor Double-V Belts for serpentine drives. In addition to ordering information and specifications, includes graphically illustrated sections on the comparative advantages of straight sidewall construction in V-Belts. Bulletin M-201, Manhattan Rubber Division, Raybestos - Manhattan, Inc., Passaic, N. J.

New Edition of The Folding Carton

Second revision of this booklet which was originally published in 1950. Available in January. Gives new feature — an extensive glossary of terms used in the manufacture of folding cartons, diagrams of the most popular carton styles, complete descriptions of the manufacture and use of cartons, and instructions for ordering. Back orders for 1950 edition, which has been out of print for several months will be filled as rapidly as possible. The Folding Paper Box Association of America, 222 West Adams Street, Chicago 6, Ill.

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WRITE FOR LITERATURE

VAPO SYSTEMS

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Figures of the Week

PAPER PRODUCTION RATIO REPORT—American Paper & Pulp Assn. Figures
(Production as per cent of normal capacity)

COMPARATIVE WEEKLY SUMMARIES

	Dec. 31, '60	Jan. 7	Jan. 14	Jan. 21	Jan. 28
1961	59.5	82.1	90.4	88.9r	89.7
	Jan. 2	Jan. 9	Jan. 16	Jan. 23	Jan. 30
1960	80.6	95.4	97.4	96.9	96.3

r Revised.

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1960	96.5	97.7	98.1	96.9	97.6	96.1	81.2	91.7	89.1	94.8	92.0	80.3‡	92.8‡
1961	87.3‡												

‡ Preliminary.

COMPARATIVE YEARLY SUMMARIES

	1954	1955	1956	1957	1958	1959	1960	1961
Year to Date	94.2	93.6	98.9	94.2	87.0	87.8	96.5	87.3
Year Average	91.6	96.2	97.9	90.4	87.0	92.2	92.8	

All of the above data is based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available.

PAPERBOARD OPERATING RATIOSt—National Paperboard Assn. Figures

COMPARATIVE WEEKLY SUMMARIES

	Dec. 31, '60	Jan. 7	Jan. 14	Jan. 21	Jan. 28
1961	39	77	92	90	90
	Dec. 27-31	Jan. 1-9	Jan. 16	Jan. 23	Jan. 30
1960	44	80	97	95	97

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1960	92	95	94	93	94	92	78	94	88	93	86	73	89
1961	88												

‡ Preliminary.
† *Per cents of operation based on "inch-hours" reported on a 6-day basis to the National Paperboard Association.*

SUMMARY OF PAPERBOARD STATISTICS—National Paperboard Assn. Figures

ITEM	WEEK ENDING Jan. 28, 1961	WEEK ENDING Jan. 21, 1961	CUMULATIVE TO DATE Jan. 1, 1961 to Jan. 28, 1961
% Activity	90%	90%	88%
Total	313,805	310,328	1,096,581
Containerboard—Domestic Use	155,399	154,267	540,733
Liner	104,520	104,220	359,462
Corrugating Material	46,442	46,236	165,260
Chip & Filler Board	4,437	3,811	16,011
Boxboard—Domestic Use	102,316	101,595	353,992
Folding	59,356	58,000	208,854
Set-Up	9,995	10,601	36,370
Special Food Board	32,965	32,994	108,768
Other Paperboard	56,090	54,466	201,856
Containerboard Type	27,694	24,879	96,985
Boxboard Type	28,396	29,587	104,871
Total Orders			
Received	302,344	297,119	
Unfilled End of Week	380,337	388,200	

Alvin H. Johnson & Co.

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415 LEXINGTON AVENUE NEW YORK 17, N. Y.

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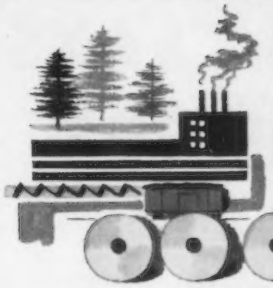

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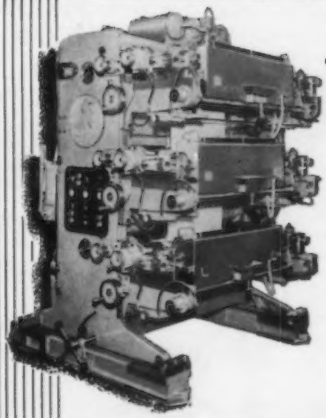
NEW POTDEVIN Multi-Color FLEXOGRAPHIC PRESSES



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Designed as end printers for tandem operation with other web fed equipment. The Series 500 POTDEVIN Presses are available in 21", 26", 32", 36", 38" and 42" web widths.

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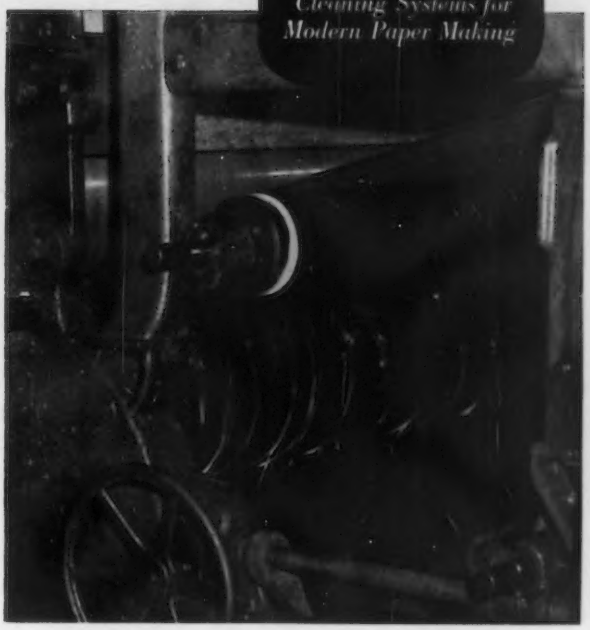
Designers and manufacturers of equipment for Bag Making, Printing, Coating, Laminating, Gluing and Labeling.

Modern Cleaning Systems for Modern Paper Making



How to prolong felt life without downtime

Excessive downtime often makes washing felts more costly than buying new ones. An Oakite cleaning system solves the problem. It keeps felts in top form—while they're at work!

How? A permanent shower system is installed over the felt. When soils clog felt, a solution of a recommended Oakite felt washing compound is sprayed on, loosening soil, lifting the nap. Clear water rinsing flushes away dirt and solution residues. Felts are left clean, soft and full-napped. They last longer . . . paper is kept free of foreign matter . . . there's no lost time.

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Modern Cleaning Systems

In our 52nd year Export Division Cable Address: Oakite

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32 illustrated pages of engineering data, including nozzle spray characteristics, capacities, applications and simplified nozzle selection tables.

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BULLETINS: Square spray and solid jet patterns.

DATA SHEETS: Leak-proof adjustable joint, phosphatizing nozzle and roof cooling.

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Write today . . . take advantage of Steinen's complete engineering service.

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METAL HOSE COMPANY

- for the most comprehensive line of all metal flexible hose . . . in all types and sizes . . . for diverse industrial use.
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$5,000 to $50,000

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PERSONNEL CONSULTANTS TO THE PULP, PAPER & ALLIED INDUSTRIES

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TF

WANTED

Engineer for Sales Work at Midwest Headquarters

of one of the best known manufacturers of a product that is used on most all pulp and paper mill machinery.

Require engineering graduate with some paper mill engineering or maintenance experience.

Age 30 to 35, preferably married—not a requisite.

A real opportunity for the right man.

Address box 61-15
Care of PAPER TRADE JOURNAL

F-13

INDUSTRIAL ENGINEER

Eight-ten years experience in methods work, economic studies, materials handling, capacity analysis and plant layout. Paper making and converting experience desirable but not essential. Must have ability to develop and complete major projects on own initiative. For large paper making and converting paper mill in N.E. Florida. Salary to $9,500. Give all past experience in first resume to Box 61-23, care Paper Trade Journal.

F-20

Help Wanted

SUPERVISING ENGINEER
PULP & PAPER MILL PROJECTS

Graduate engineer with exceptional pulp and paper mill experience and executive talents sought by leading equipment supplier and general contractor for complete pulp and paper mill projects.

This is a position of high responsibility offering creative opportunity for breaking new ground in the international pulp and paper industry.

Requires location in London and immediate attention to several projects now in progress.

Applicant must be qualified to organize internal engineering staff and supervise designing, specifications, and purchase of equipment for complete mill projects. Also supervise services of consulting engineers.

Solid mechanical and/or chemical background necessary and experience in contract negotiation. Moderate travel required. Knowledge of foreign languages desirable but not essential.

Please submit full resume including salary expectations. Replies held in strict confidence.

PARSONS & WHITTEMORE/LYDDON ORGANIZATION

250 Park Avenue Room 1000-2 New York 17, N. Y.

F-20

LATEX OR RESIN CHEMIST

experienced in application research in high gloss coatings, colored paper coatings, or coating paper with latices or resins. Position can be developed entirely along research lines, or lead to technical sales or production positions that will open. Company in mid-Atlantic area, in decorative, functional and printing papers, including cast coated. Salary and supervisory responsibilities commensurate with ability and experience. Address Box 61-33 care Paper Trade Journal.

F-20

MACHINE ADJUSTER

Large company establishing a new midwestern operation. This is an unusually fine opportunity for a man to be in at the start of an entirely new venture with the security of a long established company. Must have experience in the adjusting of machines which manufacture a variety of throw away paper and paper board items and the printing of these items. Needs to be a good machinist, preferably someone with some knowledge of mechanical engineering and capable of simple revisions and of building attachments to existing machines.

Company offers extraordinary paid benefits. Send resume and recent photo to Box 61-36 care Paper Trade Journal.

F-13

TAPPI Local Section Staff Man

The TAPPI headquarters office has an opening for a young man interested in providing staff liaison for TAPPI local sections and districts. New York City location. Moderate travel involved. Technical education and paper industry experience highly desirable. Interested applicants please send resumes and salary requirements to:

Executive Secretary, Technical Association of the Pulp and Paper Industry, 360 Lexington Avenue, New York 17, New York.

M-6

PLANT SUPERINTENDENT

A well established company entering new market has a position for a man with organizational ability. This man will be responsible for setting up and directing a new plant in a mid-western location. Must have a knowledge of paper, have experience in handling of printing — flexographic and gravure, and have experience in supervising a machine operation, preferably machines for making a variety of throw-away paper and paper board items. Send complete resume, recent photo and salary requirements to Box 61-35, care Paper Trade Journal.

F-13

Help Wanted

WANTED

Chemical Engineer to work in a large progressive newsprint mill in Eastern Canada. Work will consist of process studies and practical research. Graduates with two years' experience or more are preferred, and good salary and excellent opportunities for advancement are available to the right man. All replies will be answered and treated in confidence. Applications should include a resume of education and experience and should be directed to Box 61-37 care Paper Trade Journal.

F-27

CHEMIST
or
CHEMICAL ENGINEER WANTED

Graduate, with three to five years' experience in the pulp and paper industry, for an integrated bleach kraft pulp and specialty paper mill. Involves work in mill control and/or process control and development. Opportunity for a competent and ambitious man to advance to positions of greater responsibility. Excellent benefits and good starting salary. Please furnish complete particulars as to experience, education and reference to: Box 61-27 care Paper Trade Journal. M-6

PRODUCTION SCHEDULER

Southern pulp and paper mill with converting operations seeks an experienced production planner and scheduler to head up established planning and scheduling department. Prefer college graduate with at least 5 to 10 years experience. Give all past experience in first resume to Box 61-21 care Paper Trade Journal.

F-20

CHEMIST

For integrated boxboard mill — carton plant operation—located in Illinois. Some knowledge of these industries desirable. Apply in writing stating educational background, experience and salary desired to: Box #61-29 care Paper Trade Journal. F-13

Immediate position open for Graduate Mechanical Engineer. Prefer man experienced in paper or paper converting. Will accept candidate with machine design experience. Send resume, salary requirements to Rochester Paper Company, Rochester, Michigan. TF

YOUR BOSS—One Machine—Southern Folding Boxboard Mill. Outline full qualifications and background. Address Box 61-27 care Paper Trade Journal.

F-13

Help Wanted

Paper Machine Tour Foreman —experienced in Fine Papers—Bond, Ledger, Offset, Mimeo, etc. High speed machines. Plant located in the Middle Atlantic States. Send resume to Box 61-34 care Paper Trade Journal.

F-27

Situations Wanted

NEED HELP?
BLEACHED SULPHATE SUPERINTENDENT

—to insure your satisfaction, will assume position to deliver QUALITY PRODUCTION HARMONIOUSLY on a limited time basis.

Box 61-24 Paper Trade Journal F-20

AVAILABLE
Industrial Sales Rep.

Sales contact experience with plant management in paper and other industry in Wisconsin River Valley area. Good experience and education. Age 33. High mechanical aptitude. Box 61-28 care Paper Trade Journal. F-20

TECHNICAL SALES FOREIGN OPERATIONS

Presently Manager of Latin American subsidiary of US multiplant mfg. co. US citizen, engineering background, heavy experience in application and sales of machinery and supplies to pulp and paper industry. Resided and traveled Americas, Europe, fluent in several languages. Experienced in organizing and directing technical sales US or abroad, will relocate, travel. Please write P.O. Box 688, Englewood, N. J.

F-13

Situations Wanted

CHEMICAL ENGINEER
KRAFT MILL OPERATING SUPERVISOR

Can produce results. Has 10 years start-up, operation and maintenance experience plus 10 more in responsible technical positions. Seeking new connection in mill. Also consider equipment or technical sales-service. Good references. Address Box 61-19 care Paper Trade Journal.

F-13

TECHNICIAN

Development, sales, liaison, production. Kraft, rope, manila, industrial and electrical. Matrix. Converting. Thirty years background. Prefer South. R. R. Woodhead, Box 42, Great Meadows, N. J.

F-20

Retired executive, 65, wide knowledge of paper, paperboard and wallboard plants. Successful record managing engineering, sales and manufacturing. Seeks management, consulting or engineering position. For further details write c/o Box No. 61-31 Paper Trade Journal. M-6

SUPERINTENDENT:—age 48, interested in opportunity which demands and rewards for quality and quantity. Equipped with twenty two years Supervising experience, enthusiasm, ambition and desire. Address Box 61-30 care Paper Trade Journal. M-13

For Sale

FOR SALE

One Thwing-Albert Electro-Hydraulic Tensile Tester, Model 49RC, with Sentronic Recorder Model L-50; Chart speeds 1, 2 and 4/minute; pulling speed—0.1 to 20 in/minute. Wt. Scales 0-20 lbs., 50 lbs., 100 lbs., and 200 lbs. Recorder contains load extension cycling controls. 110 Volts, 60 cycles, single phase complete with standard paper test grips and load cell. Excellent condition.

New 1956—Original cost $5380.00.
Subject to Prior Sale.

If interested, advise best offer to—
Purchasing Dept.

Albemarle Paper Mfg. Co.
P. O. Box 2189
Richmond, Va.

F-13

FOR SALE
LOW PRICES

2—86" B. & S. Wet Machines; Bronze and Rubber Press Rolls; A.F. Bearings on Couches and Cylinder Molds. Complete with Gear Drives. Excellent Condition.

RUDERMAN MACHINERY EXCHANGE
Gouverneur, New York
Phone 333-334

TF

BEATERS
2—1500 lb. rag beaters, Valley Iron, bandless rolls, 54″ x 48″, cast iron tubs

CALENDER STACKS
1—3 roll 84″ face
1—4 roll 72″ face (Extra heavy duty)
1—5 roll 86″ face

CHIPPERS
1—96″ Murray 4 knife Chipper—anti-friction bearings
1—84″ 10 knife Carthage Chipper, Anti-friction bearings, with motor

COATER
1—42″ Chapman Extrusion Type Coater

CONSISTENCY REGULATOR
1—Poirier Stainless Steel, new condition

CRUSHER & HAMMERMILL
1—Murray Chip Crusher
1—Williams Hammermill
1—Jeffrey Shredder

CYLINDER MOLDS
5—36″ diameter x 75″ face, with couch rolls
1—36″ diameter x 82″ face
1—42″ diameter x 96″ face
2—42″ diameter x 106″ face
2—60″ diameter x 170″ face

DRIVES
1—Jones 21 H.P., ratio 10 to 1 (enclosed angle drive)
1—#4 Reeves Drive
2—Waterbury Hydraulic Variable speed line shaft drives (from 40 to 100 H.P.)
2—Falk Drives, 20 H.P. & 160 H.P.

DRYERS
1—16″ diameter x 54″ face (steel)
1—28″ diameter x 84″ face
1—28″ diameter x 48″ face
2—Calender Dryers, bronze, 30″ x 128″ with frames, gears & necessary rolls to make up the unit.
1—36″ diameter x 44″ face
5—36″ diameter x 76″ face
23—36″ diameter x 84″ face
14—48″ diameter x 48″ face with bearings
2—48″ diameter x 52″ face with frames, gears, bearings
2—48″ x 60″ face frames, gears & bearings
1—48″ x 96″ face
1—48″ diameter x 108″ face.
6—48″ diameter x 130″ face
1—60″ diameter x 92″ face, anti-friction bearings
1—73″ diameter x 66″ face, with bearings

EMBOSSING CALENDERS
1—43″ 3- roll Embossing Calender
1—48″ 2-roll Meadows Embossing Calender
1—51¼″ 3-roll Smoothing Calender
1—57″ 3-roll Embossing Calender
1—62″ 2-roll Embosser
1—90″ 2-roll Smoothing Calender

FILTERS
1—Oliver Filter 8 ft. x 8 ft.
1—Dorr-Oliver Filter, 3 ft. dia. x 6 ft. face, stainless steel construction, with pump

FLAT SCREENS
1—12 Plate "Packer"
4—14 Plate IMPCO, bronze vats

JORDANS
2—#1 Jones High Speed Jordans, Stainless steel tackle, A. F. Bearings, motors.
1—#1 Jones High Speed Jordan
1—Jones Standard, new spare tackle, with 75 h.p. motor
1—Noble & Wood Monarch, Type D, anti-friction bearings
1—Noble & Wood Baby Jordan, anti-friction bearings, with 20 h.p. motor
1—#6 Miami, anti-friction bearings

KNIFE GRINDER
1—70″ Seybold

LABORATORY EQUIPMENT
1—4″ face x 36″ diameter Saveall
1—Washer for 5 lb. Beater
1—24″ Saveall, stainless steel
1—20″ Fourdrinier Wet End & Press Section
1—12″ x 12″ Valley Sheet Dryer
1—18″ x 20″ Williams Sheet Dryer
1—15 lb. E. D. Jones Beater
1—Noble & Wood Cycle Beater with motor & stand
1—1½ lb. Valley Iron Works Beater, motor and stand
1—Greene Freeness Tester
1—Cady Micrometer
7—Mullen Testers, motorized
1—2 qt. Auto Clave, Stainless Steel
1—Elmendorf Tear Tester
1—27″ High Solid Coater
1—Noble & Wood Baby Jordan, anti-friction bearings, with 20 h.p. motor
2—Emerson, Jr., No. 1 Jordans, anti-friction bearings

MISCELLANEOUS
1—Bird Centriffler, built 1958, new condition.
1—Shartle Hydrafuge, 1000 g.p.m. (with motor)

MOTORS
4—25 h.p. Westinghouse, totally enclosed, ball bearing, 705 r.p.m.

PRESSAFINER
1—7″ Pressafiner, stainless steel construction, New 1955, with new spare motor

PRESS ROLLS
2—Chilled iron, chrome plated 9″ x 72″
1—Chilled iron, chrome plated 10″ x 74″

PULPERS
1—#1 Jones Pulp Master

PUMPS
1—Economy Fan Pump 6000 g.p.m. 20′ head, 50 h.p. motor

REELS
1—72″ Downingtown Reel, 2 bowl
1—84″ 3 bowl revolving reel
1—86″ 2 bowl reel
1—100″ Rice Barton 2 bowl reel, heavy duty
1—116″ Downingtown, 2 bowl, anti-friction bearings
1—123″ 3 bowl Revolving Reel
1—134″ 2 drum

REFINERS
1—Rice Barton Dynofiner, details on request
1—12″ Wiener Refiner, with 200 h.p. motor
2—36″ Bauer double disc #185E Refiners, each with two 100 h.p. motors
1—#4 Dilts Hydra Finer

ROLLS
Felt, Table, Press, Breast, Couch, etc. Various sizes and types. (Bronze, Rubber, Iron, etc.)

ROTARY SCREENS
4—#2A Bird Rotary Screens, copper vats
7—Trimbey, Senior Knotter Screens
1—#2A—50 Bird, copper vat
2—APMEW Rotary Pulp Screens

SAVEALLS
1—#6 Bird Saveall.
1—24″ Continuous Saveall, stainless steel
1—LaMort 48″ diameter x 82″ face cylinder mold
2—Savealls, cylinder molds, 42″ diameter x 106″ face, brand new vats
2—Savealls, Rice Barton, cast iron vats, cylinder molds 48″ diameter x 128″ face, complete with 18″ diameter couch rolls, all in very good condition

SHEETERS
1—160″ Hamblet, simplex, complete
1—160″ Hamblet, duplex, complete

SHREDDERS
1—16″ "Swift" Paper Shredder
2—Taylor Stiles Rag Cutters

SLITTERS & WINDERS
1—26″ Cameron Type 26-2A, complete constant tension & electric eye
4—42″ Cameron Type 6
1—42″ Cameron Type 9
1—42″ Cameron Type 26-2A
1—42″ Cameron Type 40-2
1—50″ Cameron Type 6
2—52″ Cameron Type 9
1—62″ Cameron Type 6
1—86″ Two Drum Moore & White 50″ diameter rewind
1—96″ 4 drum Moore & White winder
1—64″ Waldron, Shear cut

SLITTING DEVICE
84″ Quick change slitting device shear cut, complete

SUCTION COUCH SHELL
1—Downingtown suction couch shell only. 127¼″ face 26″ diameter

SUCTION COUCH ROLL
1—Beloit 36″ diameter x 246″ face, SKF bearings

SUCTION FELT ROLL
1—Gilbert & Nash 122″ face

SUCTION PRESS ROLL
1—Sandusky 18″ dia. x 138″ face Suction Press Roll

SUPER CALENDER STACK
1—9 Roll 56″
1—13 roll 53″ Norwood, anti-friction bearings

TOILET WINDERS
1—72″ Hudson-Sharp (Surface type winder)

TRIMMERS
1—44″ Seybold Trimmer
1—95″ Seybold Trimmer, Model 15ZJ

VACUUM PUMPS
2—#3 Nash Hytor
1—#4 Nash Hytor
1—#7 Nash Hytor, with 75 h.p. synchronous motor
1—H-3 Nash
1—H-7 Nash
2—K-5 Nash
2—L-4 Nash
3—L-5 Nash
1—L-6 Nash

VATS
2—Brand new Downingtown Iron End Vats, for 42″ diameter x 112″ face cylinder molds. Will cut down to your size.

WET MACHINES
1—84″ IMPCO Wet Machine

YANKEE DRYERS
1—60″ diameter x 92″ face, anti-friction bearings
1—73″ diameter x 66″ face, with bearings
1—12 ft. diameter x 181½″ face

Paddy Ross, Pres.

J. J. ROSS COMPANY

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For Sale

FOR SALE

108" type CA Langston slitter, new 1941, with Langston type slitters, 50 HP motor and unwind stand.
62" Cameron 10-11 A score slitter, w.c. unwind, new 1946, rewind 36".
52" Cameron 10-10 A, new 1940, score slitters
92" Cameron 10-6, integral type score slitters, new 1941, rewind 30", unwind stand.
2—42" type 6 Camerons rebuilt.
1—42" type 6 Cameron, new 1941, integral score type slitters.
62" Cameron type 6.
18" Cameron 22-2K.
18" Johnston uniform tension unwind.
52" Lawson trimmer, new 1952.
64" Hamblet sheet cutter, new 1947.
64" Hamblet sheet cutter, Moore & White layboy.
84" Box frame Hamblet cutter with layboy.
Section 32 dryers, Rice Barton, 60" x 157½", with frames, gears, bearings, top and bottom felt equipment. 4—48" felt dryers, 1 lead dryer.
Type 18, 160" Cameron winder, w.c. unwind, constant tension unit.
152" type DA Langston, with score slitters, rewind 40".
84" Pusey & Jones two drum winder, drums 14 x 84", rewind 43".
42 x 150" Black & Clawson reel, new 1941, with seven anti friction a.f. spools.
106" B & S reel, 42" drum, three spools.
2—Nine roll 106" calenders, w.c. bearings.
13—B & C dryers 48 x 134", new 1941.
16—B & C dryers, new 1941, 42 x 102", with frames, gears, bearings.
45—Beloit dryers 42 x 96" with frames, gears, bearings, bottom felt.
7—Twelve plate Impco bronze vat flat screens, s.s. plates.
1—Ten plate Sandy Hill roller shoe screen, new 1953.
5—roll 144" box frame calender.
104" x 65 ft. Fourdrinier with 26" Beloit cantilever couch.
24" x 112" Downingtown suction couch.
30" x 162" Downingtown suction couch.
170" x 70 ft. R. B. Fourdrinier, 30" couch.
200" x 65 ft. Beloit Fourdrinier with 30" Beloit cantilever suction couch.
4—Beloit rubber covered suction press rolls, 34" x 235" drilled face.
2—Beloit suction couches 40" x 214" drilled face, new 1948.
65—Moore & White dryers 36 x 84" d.d. frame, gears, bearings.
20—Pusey & Jones dryers 48 x 132".
7—Rice Barton dryers 48 x 152".
5—Rice Barton dryers 60 x 164" with bearings.

FRANK H. DAVIS COMPANY, INC.
175 Richdale Ave., Cambridge, 40, Mass.
F-13

Sales Representation

PACIFIC NORTHWEST MANUFACTURERS' REPRESENTATIVE

seeking additional account with equipment manufacturer. Accept only established products requiring engineering representation. Twenty years experience in operation and sale of pulp mill equipment. Box 61-25, Paper Trade Journal.

F-20

Wanted

DRYER WANTED—36" dia. 87" face. Address Box 61-32 care Paper Trade Journal. F-13

BUY U. S. SAVINGS BONDS

I know the trade name — but who makes the product?

Who makes agitators?

What's a good source for pigments?

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What's the capacity of the Hudson Pulp and Paper Corporation?

The answers to any and all these questions, and hundreds more, are found in a few seconds if you have a copy of the 1961 Lockwood's Directory of the Paper and Allied Trades in your office.
$15.00. Prepaid.

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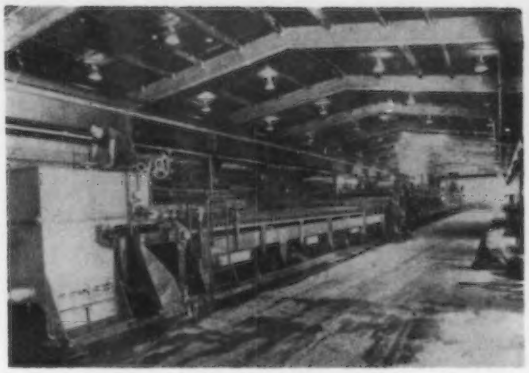
TRAVELER'S EDITION—Contains ONLY the complete reports of the Paper and Pulp Mills as shown in the regular edition, the maps, the index to the mills and the alphabetical list of mill officials and executives.



Rice-Barton 84" Fourdrinier Paper Machine consisting of 84" wire 49' 11" length, two dryer sections, first section 16 dryers 42" dia. x 84" face, second section 7 dryers 36" dia. x 84" face, complete with top and bottom felt dryers, two size presses, verigraph moisture controller, four-roll calender stack, two-spool reel and a four-drum Moore & White winder.
This machine has been producing blueprint, bond, ledger, vellum and onion skin.

Rice-Barton 65" Fourdrinier Paper Machine, two presses, 16 dryers, size press, calender stack, reels and winder, also complete with drives—for less than $10,000. Priced very low for this quality machine.

The above Machines are complete, ready to run, can be seen on original foundations. Delivery immediately or can be held until April 1st, 1961.

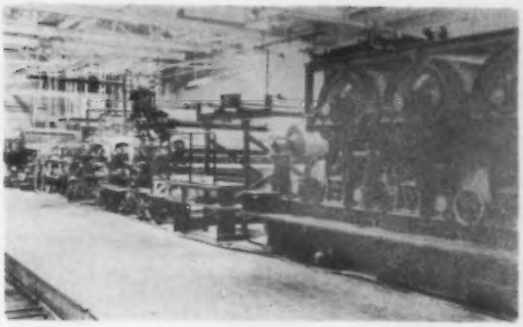
1—136" Fourdrinier Paper Machine designed for wire 134" x 75', breast roll 18" dia., suction couch 24" dia., 6 suction boxes, table rolls, wire rolls, A. F. bearings, 20" dia. driven dandy roll.

Press Section—
First Press, 20" dia. suction roll, 20" dia. top press, air cylinders, 8¾" dia. felt rolls, A. F. bearings, stretchers, felt guides, etc.

Second Press—
Same as first press except bottom roll 20" dia.

Third Press—
Same as second except for reverse press.

Dryers
20 Dryers 48" dia., 130" face, double deck frames dryer felt rolls and stretchers, rope carriers, guides, etc.
1—8-Roll calender stack complete, pope type reel, Cameron winder.
7—Enclosed angle drives with Fawick air clutches.
All above fully reconditioned and guaranteed, designed for 1000 FPM or over. Additional dryers if desired.



BEATERS

2—Dilts 66" x 54" keyed bandless beater rolls
2—E. D. Jones 2000# capacity washers, roll size 67" x 60".
6—E. D. Jones beaters, rolls 52" x 48", with NEW type 304 stainless steel fillings. These beaters are complete with stands, bronze beater hoods, stainless tubs if desired.
1—E. D. Jones beater roll 48" dia. x 42" face, 60 bars.
1—E. D. Jones beater roll 46" dia. x 48" face, 60 bars.
1—E. D. Jones beater roll 50" dia. x 48" face 66 bars.
1—E. D. Jones beater roll 54" dia. x 54" face 66 bars.
All the above beaters can be furnished with stainless or carbon steel tubs.
1—Dilts extractor type beater, 64" x 48" roll 2000# capacity, cast iron tub, 75 HP motor and starter.

JORDANS

1—N. & W. Pony Monarch with A. F. bearings and stainless steel fillings, direct connected to motor.
2—E. D. Jones Majestic with stainless steel fillings.
1—Emerson No. 1 Jordan with 3/16" good fillings.
1—Noble & Wood Mammoth Jordan with stainless steel fillings.
1—E. D. Jones standard Jordan No. B143.

STOCK CLEANERS

22—Nichols Freeman vortrap classifiers 4" primary units with 4" secondary units, bronze and stainless.
21—Bird 6" primary dirtecs with 2" auxiliary units, stainless steel stock header and Hills-McCanna diaphragm valves, all reconditioned.

SCREENS

2—Bird 3A rotary screens with new stainless steel vats and stainless steel plates cut .014.
2—2A Bird rotary screens with copper plates cut .014 and .018.
5—Sandy Hill 12-Plate flat screens, roller shoe type with rakers, fully rebuilt.
1—Dunbar type 10-plate flat screen like new.
1—APMEW 4-Plate flat screen size 42" x 48" with stainless steel flow box, No. 9685 A. F. bearings.
1—Trimbey Senior screen, bronze cylinder and plates.

SUCTION BOXES

5—Cast bronze suction boxes 100" face.
3—Stainless steel suction boxes 13½" wide, 13" deep, 125" face with end grain maple wood covers.

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1—Hamblet 100" sheeter and backstand Type 1-S, complete with layboy and drives.
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2—90" Bagley & Sewall 2-spool upright reels.
1—Two-spool 108" Pusey & Jones Upright type reels.
1—Two-spool 76" Sandy Hill upright type reel.

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6—Dryers (Downingtown) 42" dia. x 116" face.
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1—Gould Size 6, 900 GPM 105' head.
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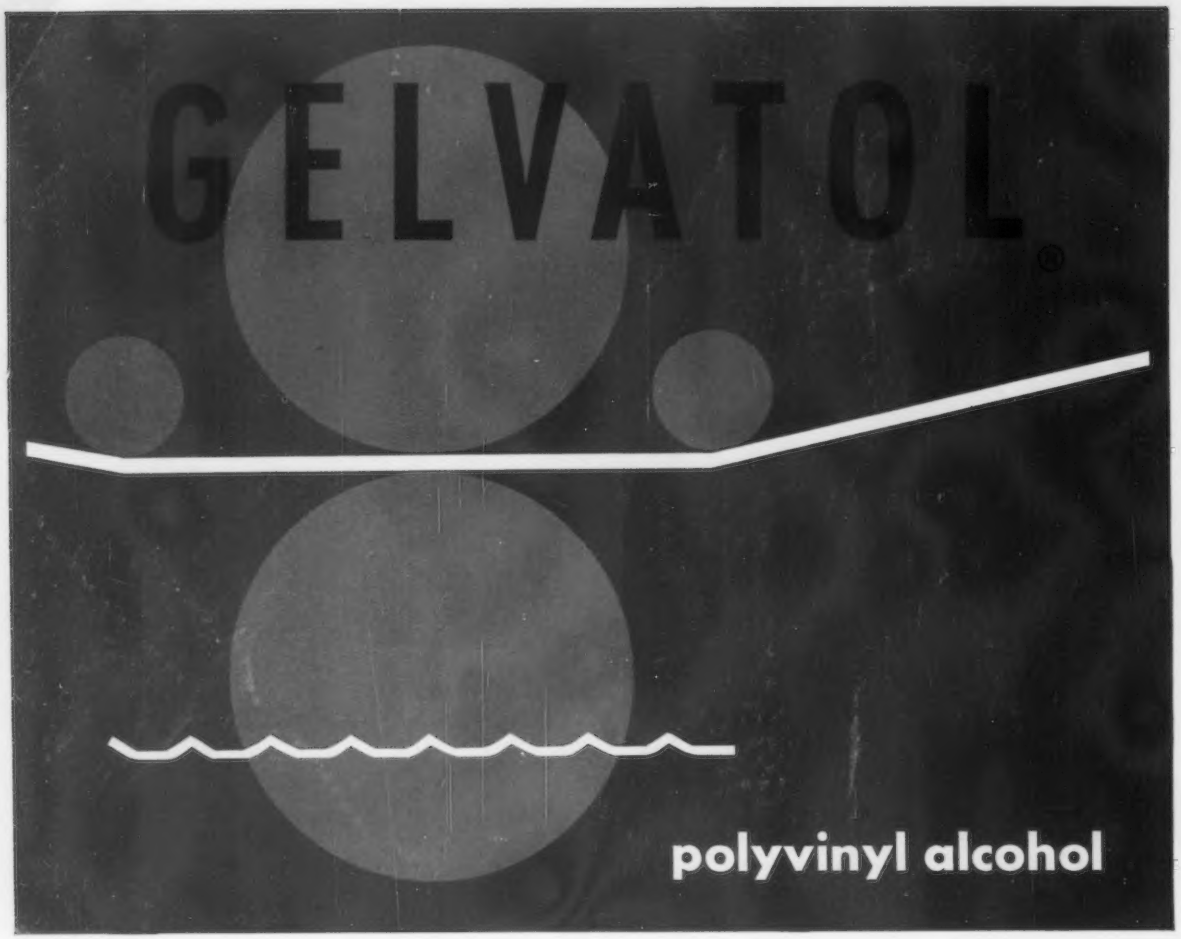

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